LET US ENCOMPASS THE EARTH WITH A NEW ORDER OF TIME

VOL. X FOURTH QUARTER, 1940 No. 4

WITH this fourth-quarter issue of the *Journal*, one's attention instinctively turns to the close of the year with the December message of good will toward men ringing in our hearts, thus leading our thoughts and actions to the new year upon which we are embarking.

Good will is the essence of human relationship and the basis of our religious, social and civil life. From it emanate those dynamic qualities which are the constant hope of a finer and better world for mankind: brotherly love and neighborliness. Any failure in these qualities would only add to the discord from which, alas, the world is so grievously suffering today.

Toward fulfilling in an ever greater degree the world-wide ideal of good will, The World Calendar Association, with its members and friends reaching out to every part of the earth, is steadfastly sponsoring a calendar that will not only achieve a greater spirit of harmony, order and balance in its arrangement, but also will encourage through its direct contact and usage these same characteristics in the life of every man, woman and child. For Time recognizes no favorites or boundaries. It has, therefore, a marked effect on civilization since the latter is actually dependent upon the calendar. The World Calendar, by cojoining the various units of the year and by making this coordination permanent, would greatly aid in harmonizing our daily living. Thus would be eliminated many sources of friction that exist today in the daily exchange of our economic, social, educational and religious life. A greater spirit of good will would prevail.

The World Calendar may easily lay the foundation for the birth of a finer and newer world upon this map of Time. Toward this objective, as the President of the Association, may I call upon its hosts of friends and supporters, known and unknown, to aid in realizing its goal? Only by this continued cooperation can The World Calendar become a herald of a new day and a messenger of good will to all men.

ELISABETH ACHELIS.

Journal of
CALENDAR REFORM

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1940

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A PERMANENT DATE FOR EASTER

By The Right Reverend Ernest Milmore Stires

Bishop of the Diocese of Long Island, New York

THE increasing inconvenience of a constantly changing date for Easter is hastening the general acceptance of the proposed World Calendar. This year Easter Sunday came on March 24, within two days of the earliest possible time; next year it will be April 13; in 1942 it will be April 5; and in 1943 it will be April 25, the latest day on which it can possibly fall. The clergy of all Christian churches are conscious of much unnecessary work in annually adjusting church programs to a rather long series of changed conditions and dates. Millions of church members are also conscious of various kinds of inconvenience.

Not only church schools, but all schools, in arranging for a spring or Easter holiday, have had to wrestle with this same difficulty which compels a somewhat radically altered school calendar every year. It would not be difficult to present an impressive list of important enterprises, religious and secular, which are directly affected by the changing date of Easter, and which would be immeasurably encouraged and improved if the churches could agree upon a fixed date for Easter, and, for that matter, if the entire world could agree upon a more intelligent calendar.

It should be unnecessary in this brief statement to repeat the history of the development of our calendar. It has been given often, but not too often, in the *Journal of Calendar Reform.* At last the whole civilized world has become aware of the urgent need of calendar reform, and appears to be ready to accept the proposed World Calendar.

In all the history of the development of the calendar, no such intelligent proposal has ever been made as that which is now before us. Let us concede that it is desirable to change as little as possible the generally accepted divisions of the year into quarters, months, weeks, and days. The World Calendar offers us four quarters containing an identical number of days, the first month in each quarter having 31 days, and the two following months 30 days each. This gives us 364 days.

And the proposed new calendar would close the year with a day which would ordinarily be December 31, an extra day—a holiday called Year-End Day, which by the way would always be an extra Saturday. This day is vital to the calendar for two specific reasons. It is the 365th day of the year, whereby its accuracy with the seasonal solar year is maintained; and secondly, the extra Saturday—the Year-End Day, always coming at the close of the year—enables every year to begin with Sunday, January 1. It is this perpetual feature of The World Calendar which is important.

The new calendar also provides that in a leap year the month of June

would have an extra day following the 30th of June, marked L. Y. D., that is, Leap-Year Day, an extra Saturday, also a holiday. These extra days which in The World Calendar are considered as "World Holidays" were devised by a Roman Catholic priest (the Abbé Mastrofini) more than 100 years ago. Religion may rightfully be proud of its share in devising these one or two "World Holidays." They not only keep the calendar perpetual and true to the natural solar year, but would also invite greater world cooperation and amity.

In this new calendar Christmas Day will always fall on Monday, thus affording a perfect opportunity for religious preparation on Sunday, especially at the Sunday night or Christmas Eve service, and giving opportunity for social gatherings on Christmas Day itself after an appropriate morning commemoration.

A careful study of the proposed World Calendar instantly reveals its extremely human qualities. It arranges to have as many holidays as possible on Monday, thus providing for a longer week-end, and preventing the interruption which is inevitable when holidays come in the middle of the week. It wisely proposes, for example, that we return to the original date of Washington's Birthday, February 11, which in the course of his lifetime was changed to February 22 by the addition of 11 days when the Gregorian calendar was adopted by Great Britain and her Colonies in 1752. This would cause Washington's Birthday to fall on Saturday, February 11, followed by Lincoln's Birthday on Sunday, February 12, (celebrated on the next day, Monday) thus providing for a substantial holiday at the same time each year without the breaking up of two different weeks by the shifting birthdays of these two great patriots.

It is not strange that the movement for an improved calendar is rapidly gaining headway. At various meetings held in London, Brussels, Berne, and Paris, members of the International Chamber of Commerce, representing 25 to 47 nations, have gone upon record as favoring an improved calendar, and chambers of commerce, industrial associations, universities, and other societies of learning, have all demanded the assemblying of an international commission to deal with this problem which they have considered to be extremely urgent.

Churchmen are primarily interested in a fixed Easter which would permit all Christendom to observe this important festival on the same day. The result of careful scientific investigation gives us April 9 as the probable date of the first Easter Day. In our present calendar, Easter Sunday will fall on that date only twice in the next ten years, and after that, not at all for more than 60 years. How much better to commemorate Easter every year on the eighth day of April, the second Sunday in April, as provided in The World Calendar, and feel reasonably sure that it is close to the very day which is an anniversary of the great historic

event which gives Easter its profound religious and spiritual significance.

When the General Convention of the Episcopal Church met in Atlantic City in October, 1934, approval of the proposed World Calendar and this fixed date for Easter was given by an overwhelming vote in both the House of Bishops and the House of Deputies. It is true that at the Convention in Cincinnati in 1937 an unsuccessful effort was made to reconsider this action, on the ground, only, that the year of 13 months, as contrasted with a year of 12 months, had not been sufficiently considered. In the last three years, we have heard less and less of the proposal to divide the year into 13 months. The fact that 13 months are not divisible parts of the year, that they break the harmonious rhythm, disregard the equal-quarter section of the calendar, and change familiar days and dates of religious significance —all these have proven a formidable barrier against its acceptance. In contrast, the rhythm and harmony, order and balance, and ease with which The World Calendar responds to the various needs of our modern life, have lifted it far above any other plan.

The time is ripe for effective action. Let us hope that the religious forces of America, and indeed all the Christian Churches, may be sufficiently interested in the movement for a stabilized Easter and sufficiently convinced of its value in The World Calendar to arrange for a thoroughly representative conference, in the hope that in this time of war and world restlessness we may agree upon one unifying principle whose influence would tend to bring all the thought and work of the world into greater harmony, and help to prepare for a more righteous and orderly arrangement of all human affairs, which should follow or even precede and lead the way to a just and intelligent peace. Such a world religious conference of churches should not find it difficult to agree, and to prepare identical resolutions to be presented to the various religious bodies represented, bringing to Christianity a permanent date for Easter in an orderly system of Time.

Of course it will take time, but let it not take too much time. Those who are particularly interested in The World Calendar are hopeful that it may become effective by January 1, 1945. In that year Easter, in the new World Calendar, will be observed within one day of the 1944 date, April 9, namely, the new April 8, and thus come only one date earlier than the supposed historical date. An unusual opportunity, therefore, rests with religion to make effective this reform and demonstrate to mankind a *united* Christian purpose through the joint observance of a permanent Easter Day and a permanent Christmas Day to be celebrated respectively on Sunday, April 8, and Monday, December 25. It is the sincere hope of many that this desirable event will become an actuality by 1945.

EDITOR'S NOTE: The United Press surveyed Episcopal opinion before the 1934 Convention with the following result: 238 replies, 187 for World Calendar, 22 for 13-month, 210 for fixed Easter and 19 opposed. See *Journal of Calendar Reform*, 1934, page 120.

DO IT NOW

By Richard G. Bowman

Consulting Engineer

RECENTLY, while supervising the production of a large order of military trucks for a foreign power, I was asked to conduct members of that country's purchasing commission through the Detroit automobile factory where the trucks were being made. Like all visitors to the factory they were fascinated by the almost magical efficiency of the assembly line and remarked upon the precise timing with which its multitudinous functions were performed.

Though familiar with mass production methods they were nevertheless impressed as engine blocks, coming from another part of the plant on overhead cranes, were set down with clockwork regularity upon completed frames when these in turn reached a certain point in the assembly line; as magnetos, carburetors and transmission cases jumped into place on the motors, wheels were attached to the frames, then cabs; as, in almost less time than one man could assemble the parts of a wheel, a badly-needed truck rolled out onto the loading platform.

Back in my office, a member of the commission remarked on the efficiency which he had observed. Yet he could not understand why, in a set-up where even seconds were not wasted, there was going to be a delay of six days in the completion of the order.

Pointing to a calendar on my desk I explained that although an inaccurate clock would not be kept in the plant one minute, we were forced to hobble along with a calendar that never hit on all cylinders. I tried to show that although the various processes within the factory are governed by the clock, the production of raw materials and the manufacture and delivery of parts outside the factory are governed by the calendar.

The motors we had seen on the assembly line had been in one stage of manufacture or another for more than half a year. Various parts had been ordered from other concerns as soon as the blue-prints were completed. So, though the trucks were being put together in a week, they had actually been in production much longer. Ordinarily it is possible to compute just how long each of the processes in the manufacture of a truck will take. Knowing how long each process will take it is not difficult for engineers to coordinate the entire operation so that no time is lost. This is done by merely allowing "safety margins," a few days leeway for delays. But when an order is placed in haste and produced in haste, under the stress of emergency conditions, the entire picture is changed.

The case at hand is a good example. According to hastily-made plans the first truck was to have rolled off the line on Wednesday, August 7.

Because of delays in delivery of wheels, clutches and motor parts, production did not begin until Tuesday, August 20, two weeks behind schedule.

The building up of this long delay reminds me of the rider who was lost for want of a nail for his horse's hoof. If, for want of time, magneto coils cannot be completed, the magnetos themselves cannot be finished. Without magnetos motor assemblies cannot be made. And without assembled motors it is impossible to put into operation the final assembly line.

To go back to a particular example, the delay in delivery of the magnetos: these were ordered on Thursday, April 25, for delivery Wednesday, July 24. The plant had obtained delivery on comparable orders in 90 days before. It should have been possible again. But the supplier brought it to our attention that in this particular 90-day period there was a total of only 68½ days in which his plant operated. There were two days in addition to Sundays when his factory would be closed down—Memorial Day, which fell on Thursday, and Independence Day, which also fell on a Thursday. Besides, the efficiency lost in winding coils, a highly technical operation, before and after the two mid-week holidays would result in an additional day's delay. We finally settled on July 27 as the delivery date for the first completed magnetos, but this was a Saturday and they lay unused until Monday, the 29th. Six days after we had wanted them, the magnetos were ready for installation.

Part of this six-day loss was directly due to shortcomings of the imperfect and inefficient calendar. And this is only a single example of many "calendar" delays experienced on the job. I don't think a more forceful argument for immediate calendar reform than this could be given at a time when our country, besides producing vast amounts of military supplies for other nations, is engaged in a vast rearmament program of its own. Much has been said about "bottle necks" that exist in industrial production—the lack of skilled personnel, the shortage of facilities for making machine tools and so on. Millions of dollars and endless effort are being expended to get rid of these "bottle necks." One very important "bottle neck," an inefficient calendar (which frequently drops holidays in the middle of the week and otherwise meanders aimlessly along with unequal numbers of working days in its months and quarters), could be eliminated at almost no cost and with very little effort, and at a time when it is urgent to do so.

Revisions in the calendar have been made in previous ages—mostly under the stress of necessity. The Egyptians abandoned the lunar calendar for a solar seasonal one more suitable to their agricultural life which depended upon the accurate computation of the rising and falling of the Nile. Although this same need did not exist in Rome, it was essential to adopt an orderly and regular calendar for Roman use. The Egyptian calendar was therefore revised and adopted for Roman use under Julius Caesar, and endured more than 1,600 years until the time of Pope Gregory XIII.

Then because of a slight lag between the calendar and the seasonal year, repairs again became necessary. It is significant that no change has been made since then—though the civilization of the Western world has evolved from an essentially agricultural to an essentially industrial one.

Daylight Saving Time, initiated in another period of national emergency, went only part of the way. It adapted the day to better use for agricultural and industrial production. The World Calendar must now go the rest of the way, adapting weeks, months, quarters and the year itself to the new needs of an intensified Industrial Age.

BUSINESS AND PROFESSIONAL WOMEN'S APPROVAL

Report of the Calendar Reform Committee, National Federation of Business and Professional Women's Clubs, Inc. (From *Independent Woman*, August, 1940)

THE committee asked to study calendar reform gave serious consideration to this question and now reports its findings. First, it was of interest to your committee to note that the head of The World Calendar Association proposing the reforms is an American woman, Elisabeth Achelis. Our second discovery was the extent of the endorsement of The World Calendar Association's method the world around. To date it has been approved by 14 nations and endorsed by many organizations such as the American Association for the Advancement of Science, state and city Chambers of Commerce in the United States as well as influential British and Empire Chambers of Great Britain, the General Federation of Women's Clubs and the Labor Conference of American States held at Santiago, Chile, in 1936.

Perhaps our greatest discovery was the reforms which The World Calendar Association stands for and their importance to those of us who work in business. In this new calendar all the time-units are of equal worth and correlate with each other at the end of each quarter. It takes our year of 12 months, divides it into 364 days with an extra day (called Year-End Day) at the end of December. It also adds Leap-Year Day every four years. It proposes quarter-years of 91 days each or 13 weeks or three months, corresponding to the seasons. Each quarter begins on a Sunday and ends on a Saturday. No discrimination is shown the day, week, or month. Your committee was delighted to find that this new calendar was as much against discriminations as is our Federation.

The earliest time when The World Calendar could be put into active operation easily is 1945. The last day of the preceding year, 1944, falls on Sunday. By considering that day as Year-End Day, placed on an extra Saturday, our calendar would read like this: December 30, 1944 would be a Saturday in both the present and the new calendars. The next day, being the old Sunday, December 31, would become "Year-End Day," an extra Saturday. The following day would be Sunday, January 1, 1945, under the new calendar. Could any change from old to new be simpler and easier than this?

Your committee wishes to recommend: 1. That the National Federation of Business and Professional Women's Clubs, Inc. endorses the calendar reform on the perpetual 12 month plan of equal quarters, known as The World Calendar and requests the United States Government to cooperate with other governments in bringing about calendar reform with a view to making The World Calendar internationally operative whenever the time for such cooperation is deemed proper by government officials.

Adopted

Respectfully submitted,

EFFIE ROGERS, Chairman

AGNES MANTOR, EMILIA KENNEDY.

TIMEOLOGY

Address on Timeology Day, at the New York World's Fair, September 1, 1940

By ELISABETH ACHELIS

President, The World Calendar Association

RADIO has been the outstanding influence in making us all time-conscious and it is also making us alert to the real significance and value of time. Mark Hawley, the nationally known news commentator, estimates that one minute of radio time is worth $180. Now if one minute is so costly, would it not be well for all of us to check our clocks for accuracy and to have a keener appreciation of time?

Today, a clock that is an accurate and orderly time-keeper is more valuable than the costliest ruby or diamond. In fact, the clock and the radio are indispensable team-mates. On their complete agreement depends the success of a broadcast. If, then, the accuracy and order of the clock are so valuable to radio, they must have an equal value as well in many other activities in which we are engaged—and in life itself!

But there is another vital factor in the realm of Time, and that is the calendar! It comes as a distinct shock to many of us to realize that the calendar, with which we are all so familiar and which we use every day of our lives, is just the opposite from the orderly clock. The calendar is everything it should *not* be; it is a vagrant and a waster, for nothing in it fits. We all know how month-dates and weekdays play a wild-goose chase with each other, year after year; they never agree!

Tomorrow is Labor Day, the first Monday in September, that pivotal day around which summer vacations end and school terms begin. This year it comes early on September 2, but when did it fall last year; and when will it fall a year hence, or in two or three years? We never know. We glibly say "the first Monday in September," but what about the date? It may have as many as seven different dates on which it can fall—from the 1st through the 7th of September. Our changeable calendar of today has months of four different lengths, 28, 29, 30, or 31 days, and these never begin on the same day of the seven-day week. Months may have four or five Sundays, Mondays or Fridays. We say Thanksgiving falls on the last Thursday in November, but it may fall on the fourth or the fifth Thursday (or as our President has changed it, the third or fourth). All this uncertainty has its natural reaction in our lives; on business, transportation, vacations, schools, social engagements, civil and religious holidays.

Just imagine, if you can, what it would be like if our clock had different lengths of hours for morning, noon, afternoon, or evening. What frantic moments we would have in telling time! Yet this is what actually happens in our present-day calendar—most confusing and bewildering, isn't it?

The purpose of improving our present unsatisfactory system is to give it the same order and stability which exist in the clock. I believe you will all agree that this is plain common-sense. And, because it is common-sense, the changes, too, should be sensible and simple. There is nothing drastic or revolutionary about the improved World Calendar.

In The World Calendar the customary 12-month year is retained but divided into equal quarter and half-years. Each quarter-year has its familiar three months, with the months, however, more equally apportioned: the first month always has 31 days and the other two, 30 days each. With every quarter beginning with Sunday and ending with Saturday, each has exactly 91 days, or 13 weeks or three months. And because every one of the four quarters is identical in arrangement, year in and year out, the calendar will be every year the same. But you will say that quarters of 91 days each give the year only 364 days. I will speak on this in a few minutes.

In this orderly calendar month-dates and weekdays will always agree. The weekday will at long last come into its own and be no longer the neglected Cinderella of the calendar. Historical events and personal anniversaries will be remembered as to *day* as well as date, month and year. How gratifying it would be could we have had the complete recording of our Independence Day with its weekday instead of only July 4, 1776.

And then, too, we would be more accurate with our own birthdays which are not really birthdays at all but birth-dates. Christmas in the new calendar would be always Monday, December 25. And a fixed Easter date, too, would be possible, but that is a matter for the churches.

The World Calendar will have the same simple order and dependability as the clock has. And here we have two perfect instruments of timeology. The clock, the smaller of the two, begins immediately after midnight and ends on the stroke of 12 (midnight) and consists of three important divisions: seconds, minutes, and hours. It never varies. The calendar, the larger instrument, begins in The World Calendar with Sunday, January 1, and ends with Saturday, December 30, also consisting of three important divisions: days, weeks, and months. It, too, is perpetual.

But here our analogy must end. For the day of 24 hours is divisible and complete; whereas the year of 365¼ days is *not* divisible and is incomplete. What *is* to be done with that necessary 365th day and the fractional day which, in four years, becomes the 366th day in leap year?

Back in 1834 a priest, Abbé Mastrofini, solved the difficulty. The 365th day every year is placed on an extra or double Saturday immediately following Saturday, December 30, and just before Sunday, January 1. It is a Year-End World-Holiday. And the 366th Leap-Year Day is placed in the mid-year, immediately following Saturday, June 30, and just before Sunday, July 1. It is another World-Holiday, the Leap-Year Day, whereby the calendar achieves a perfect balance. For the first time in calendar history, the calendar will have one or two World-Holidays—holidays on which the entire world may come together in amity, understanding, cooperation. What a glorious outlook—to have all nations, races, governments, peoples, and churches observing one and the same holiday throughout the world every year and an additional one in leap years: holidays of civic observance, of spiritual values, joy-giving, of forming

friendships and of uniting all the various countries on these world days.

With The World Calendar in operation all nations would speak the same time-language, and speaking the same time-language, would beget a closer understanding. Such a timeology is priceless and will pay untold dividends of happiness and satisfaction.

Yes, you may say, all this is very fine, but when and how can we have it?

It is just as easy of adoption as is the arrangement of The World Calendar itself. For simplicity of one kind makes for simplicity of another.

Naturally, we wish to make the transition easy. The perpetual World Calendar of 12 months and equal quarters can be introduced when either the beginning or the closing of the present calendar falls on the same day and date with the new one, so that the old calendar would merge with the new with no confusion whatsoever. Such a date is Saturday, December 30, 1944. On that day, date and year, both the old and the new meet. The following day in the old calendar, Sunday, December 31, would then become the extra Saturday, the "Year-End Day." This new World-Holiday (tabulated either December Y or 31) would then be followed by Sunday, January 1, 1945, of the new World Calendar.

Fourteen governments have officially approved it; and were the United States to join we might be assured that The World Calendar would be virtually adopted. In the past, calendar reforms were inaugurated by countries in the Eastern Hemisphere, but with war clouds hanging heavily over there, we have every reason to believe that the Western Hemisphere will take a hand and the United States be the leader.

The United States could easily call an international conference on this universal and non-partisan subject, for, like Time itself, the calendar recognizes no discrimination or partiality. It belongs to every man, woman and child of every land, and unites us all under one common-bond-of-time.

At such an international conference a treaty would be drawn up for approval by the various nations. And taking the adoption of the Gregorian calendar as a precedent, it is not essential to have world unanimity, although, of course, the greater the number of nations to ratify it, the more general would be its adoption. Toward this accomplishment it is very essential for all of us, individualy and in groups, to speak, wor k, or write for The World Calendar. We should impress upon our Government, through the State Department or the President, the importance of calling such an international conference for 1942, certainly not later than 1943.

The treaty issuing therefrom, being international in scope, would not require individual voting on Election Day, as it is within the jurisdiction of the Senate, State Department or the President. Were we all to do our part in impressing and urging upon our Government to act favorably, we would by 1945 be using and living under this better calendar—a forerunner, I believe, of happier days to come.

PRINTING—CALENDAR'S SLAVE

By Joseph Guiney

Chilton Company, Printing Division, Philadelphia

A CAREFUL study of the printing and publishing field will show definitely that one of the gravest problems confronting production is the complexity of the present calendar. This is due to the irregular arrangement of uneven months; and, year in and year out, there is this continued disorder that makes the printing industry the slave of the calendar. On the other hand, a close scrutiny of The World Calendar shows clearly that its adoption would be a long-awaited boon to the printing and publishing fields and to many other industries that depend upon printing, advertising and the spread of information and knowledge for their success.

There is a great principle in the printing industry which takes root in the imperishable fact that no other industry can exist successfully on any large scale without the use and force of the printed word.

From the time that Johann Gutenberg first cast movable type and brought education and knowledge to the masses, a sluggish, sleepy world, groping blindly for expression and individual thinking, has slowly awakened to the tremendous power of type, ink and paper. Even in war and in invasion, the opposing forces distribute literature and propaganda from the skies, each pointing out, in turn, the advantage to the individual that would be his should he assist the particular distributor.

Today giant presses rumble and roll steadily and swiftly, and their products take many forms. Most powerful of all is the daily newspaper in the forming of opinions, political and otherwise, and bringing news from every part of the globe. Not only can the newspaper be read at the breakfast table, but earlier issues of the morning editions are on sale at nine P. M. of the previous evening. Speed in news is vital, and in this, the radio is faster in its news-casting, but for the full details and more permanent form to be had at your leisure and convenience, plus other general news and advertising, the daily newspaper is indispensable. In all this matter, the calendar is essential, for a newspaper that is one day old reduces its value by at least 50 per cent. The right-up-to-date issue is the life blood of the daily paper.

We have, of course, the periodical field for other news that need not be "spot" news. Weekly publications combine fiction, short stories, news articles, foreign articles, editorials and advertising. There are trade papers galore—several for each industry—some appearing weekly, others semi-monthly and monthly. Technical papers are published also for the engineers or experts in many lines and there are publications for every walk

in life and for every human endeavor. Each progressive step, each new invention, each streamlined shortcut is duly recorded for each industry for the benefit of the reader and for the advancement of production by universal acceptance of new ideas. Current prices of raw materials, future trends, and new markets, all have a commanding effect on volume and sales.

In a busy printing office and plant where hundreds are employed, it is necessary to schedule all phases of work to keep production moving at a high rate consistent with quality. A man may build a house to specifications and plan; or he may make a suit of clothes to order, but should a whim or passing fancy possess the buyer's mind, he may refuse to accept either the house or the suit. However, all is not lost—there are other buyers and the house and the suit will be sold eventually. This is not so, however, in printing. It is a made-to-order business, true enough, but there is only one market after the work is completed—the original customer. No other can find use for the product, so that far more than ordinary care and vigilance must be exercised in its perfect fulfillment of an idea, because printing only exists in dummy form until finally produced.

In the manufacture of printing on a scheduled basis, it is necessary to work backwards when preparing a schedule. Thus, in order to have a periodical reach its readers on the Pacific Coast on the first day of the month, it should be mailed four working days earlier. It should be folded, gathered, stitched and covered in the morning; wrapped and bagged for the mails, and delivered to the post office in the late afternoon. Printing should take place the day before binding and if color is employed, an extra day is often necessary. Therefore, forms have to be locked up the day before printing, or the night before going to press. Then a deadline must be set on final O. K.'s from the editor, a last date for receiving advertising, a date for receiving the pasted-up dummy which is followed when the pages are made up. A schedule, therefore, would look something like this:

Final text copy	18th
Final adv. copy	18th
Makeup dummy to printer	20th
Final color O.K. printer	24th
Final stone O.K. printer	25th
Last form to Press	26th
In Bindery	27th
Del'd to Post Office	27th
Arrive Pacific Coast	1st

These dates are flexible depending on the number of pages and the quantity printed. This type of schedule is a fair average in ordinary plants. In extremely large plants, a shorter span is possible, but in a majority of cases, this would be considered as a reasonable program. The printing industry is a helpless slave to the calendar, and when, in addition, the calendar is a faulty and unnatural taskmaster, many arduous problems arise continually. As each schedule nears completion, each hour becomes

more and more important and lost time is more difficult to overcome.

It does not take imagination to appreciate the tremendous advantage that the new and perpetual World Calendar would bring to befuddled printing superintendents who are continually trying to overcome holidays and uneven months. On five-day-week production, which is made necessary by 40-hour-week laws, binderies are frequently closed on Mondays.

Presses are shut down after the Friday night shift is finished, but the bindery workers work all day on Saturday and clean up all material that has been printed up to and including Friday night. The bindery therefore closes down on Monday all day. This means that if a periodical is unfinished on the presses on Friday night, double-time rates must be paid to pressroom help on Saturday to catch up on presswork and this expense is wasted should it be impossible to get the work out on Saturday. Such sheets are not entirely dry and smudging may result when folding.

There are also certain union regulations forbidding members to work more than a certain amount of hours overtime. If they exceed this amount, they are required to take time off and put on a substitute. This is an excellent idea to equalize wages, but the "sub" loses time familiarizing himself with new surroundings. The hours of women workers are regulated by law and no extension is permitted.

The irregular appearance of holidays has worked havoc with schedules particularly at month-ends. When it is realized that hours are precious at the tail-end of the schedule and that each operation must take a fixed number of hours, it can be appreciated why a regular stabilized form of calendar such as the equal-quarter, 12-month World Calendar would be a great boon to such an industry.

With the definite knowledge of every working day in each quarter, work would not only be scheduled—it could be synchronized and comparisons of production records could be made much more intelligently. The maintenance and study of such records are the entire basis of successful operation and do much to keep costs from rising by eliminating loss in hours. If a press stands idle after the completion of one order, because a form for another publication is not ready, that lost time is lost money. The press is there, the pressman and his assistant are ready and are being paid and they often are forced to put a form to press with "holes" in it; that is, without a final O.K., or with certain illustrations still missing to prepare the make-ready as far as possible in trying to maintain a schedule that may have failed for any one of a hundred reasons.

Commercial printing varies from publication printing in several ways. Catalogs and mailing pieces are carefully prepared for specific purposes. In most instances, their principal reason for existence is to sell a product. Anyone who has cooperated with advertising production men will recall the feverish speed that is necessary to produce printed pieces that will tie in with other advertising—whether radio, newspaper, publication or the like. It would be embarrassing to receive coupons clipped from publications requesting a booklet which had not been completed by the printer. Therefore, to synchronize all activities, such advertising campaigns often call for the mailing of a series of pieces at regular intervals. It is not considered advisable to have these arrive on certain rush days of the week as they would have to compete for attention with other printed matter. It is not good practice to send them at the time the prospect is receiving monthly bills from other sources as such competition is a doleful reminder of the necessity of foregoing necessary purchases to pay current expenditures.

Studies have been made under varying conditions to discover the day when the mail is lightest. When such a date is finally determined, we will find after a short

while, that everyone is scheduling their mailings to arrive on that particular day and it eventually becomes the most congested day.

Let us assume, however, that Monday is accepted as the best day of the week to deliver a printed piece to a prospect. If we eliminate the Monday right after the first of the month as being too near to the first, we must eliminate the Monday before the end of the month for a similar reason. This leaves the second and third Mondays as more ideally suited to our advantage. The present irregular calendar definitely prevents an intelligent and orderly arrangement of mailings that are specifically intended to break down sales resistance and induce the prospect to buy the product.

An orderly arrangement as set forth in the permanent World Calendar would easily fit into such schedules and would simply be a repeat performance on a quarterly basis. It would relieve the tension and uncertainty of the present calendar and the results should be so greatly improved from a selling standpoint as to definitely prove its worth.

Like a finely made watch, each part would fit into its place, and the whole would coordinate and work in unison for perfect performance, delicately balanced and finely adjusted for exact regulation. In like manner, many advertising schedules would fit together in one comprehensive plan, and would be particularly simplified because of the synchronization of the various time-units of this proposed World Calendar, not only in the beginning and ending of each quarter but the entire year itself. In many industries, time is the precious item and many hurried and tardy operations can be traced to obsolete and irregular calendar schedules.

Many national advertisers place advertising in small country weekly newspapers. The country weekly local newspaper is strictly a community record and neighbors and townspeople find out what has happened locally only through the village paper.

The financial backbone of the country weekly is advertising, and the difference between success and failure is the pick-up of a small amount of national advertising. This takes the form of nationally advertised products which may be sold locally by an agent, such as an automobile; or through general store sales, like soft drinks, breakfast foods, patent medicines, and so forth. The rate on this advertising is good depending on circulation, and a matrix is furnished usually. This saves money for the publisher as he does not have to set any type and needs only to mold the "mat" into metal form, and insures the advertiser that the type format will be exactly as he wishes it to be.

Because the country publisher is keen to run such material, he is constantly in touch with the advertising agency to find out what schedules have been made up wherein he is included. In many instances, where chain store advertising is involved and where several units are priced, last minute price changes are marked in red pencil on the face of the mat itself. This means that, after the printer has molded the mat, he must take the casting and saw into it at various spots and correct the prices by hand.

This will indicate the confusion that frequently results when press time is here and there has not been sufficient time to permit the advertising agency to correct the type, mold new mats and get them to the country printers on schedule. If these troubles are traced back, it will be found on numerous occasions that uneven month-endings are responsible, as many price corrections are due to advancing costs on commodity deliveries subject to periodical price changes and that such changes may appear at unexpected and irregular intervals, thus disturbing existing arrangements.

Printing has been called "the Mother of PROGRESS," and as such would gladly welcome this new ally of time with open arms. The quality of work produced on a more even schedule would be further improved and every craftsman engaged in the various branches of printing and its allied industries would be greatly benefited.

There is no question that a stabilized calendar, as proposed by The World Calendar Association, would be a tremendous improvement in this great industry and would be of immeasurable benefit to other industries.

"THE HEAVENS DECLARE"

By Dr. Roy K. Marshall

Assistant Director, Fels Planetarium, The Franklin Institute, Philadelphia

(From a Holiday Demonstration in the Planetarium, December, 1939)

THE Christmas story is one familiar to us all. In fact, it is introduced into our lives so early, and becomes so thoroughly ingrained, that only occasionally does someone think to compare it with the sacred legends of other religious philosophies. Our own scholars probe the sacred writings and other relics of other religions, some vanished and some yet flourishing, but few of us realize that the Christian religion, in spite of its comparative youth, offers an opportunity for similar research. Its early development among hostile creeds has resulted in many points of confusion.

On December 25 of each year, many of us share a festival which commemorates the birth of Jesus of Nazareth. We speak of this year as 1939 A. D.—*Anno Domini,* the Year of Our Lord—yet, we are uncertain not only of the day of the birth of Jesus but even of the year! That we should not know the day is perhaps not surprising when we realize that the teachings of Jesus did not achieve official recognition for three centuries, when, by an edict of Galerius in 311 A. D., Christians were granted religious freedom in the Roman Empire. The early history of the Church, as well as the early life of Jesus, was passed along by word of mouth, and we have no reason to believe that such transmission of information was then any more reliable than it is today. But surely we might be expected to know the correct year!

What evidence can we call on to assist us in determining the date of the birth of Jesus? There are, of course, the accounts of His birth in the Gospels. A Jewish tentmaker of Tarsus, named Paul, had written many letters in Greek and these circulated among his followers to tell of the teachings of Jesus. At the same time, a story of the life of the Master was written in Aramaic, the language Jesus had spoken, but this was lost. Other accounts, written in Greek, appeared until there were four widely popular stories of the life of Jesus. These, which we now recognize as the Four Gospels, along with the letters of Paul and certain other material, were combined later in a Greek book which, in the English translation, we know as the New Testament.

From these Gospels, we have certain indications of the time of the birth of Jesus. In *St. Matthew* it is said to have occurred "in the days of Herod the king" who, according to Josephus, the Jewish historian, died in 750 a.u.c.* (4 B. C.) a few days after an eclipse of the Moon visible from Jericho and a few days before the Passover. The only eclipse ful-

Ab Urbe Condita—From the founding of the city [Rome].

filling these conditions occurred on March 13, 4 B. C. The evidence of this statement in *St. Matthew* leads inescapably to the conclusion that Jesus was born prior to this date. This is supported by our knowledge of the error made by Dionysius Exiguus when, in 533 A. D., he attempted to establish the date of the beginning of the Christian Era. He found that, according to Clement of Alexandria, Jesus was born in the 28th year of the reign of Augustus Caesar, or 754 a.u.c. But he counted the reign of Augustus from the date of his having been given that title and not from the date 723 a.u.c. when Augustus, as Octavian, defeated Antony and Cleopatra at Actium. According to this reckoning, Christ was born in 4 B. C. But in *St. Luke* we find that "in the fifteenth year of the reign of Tiberius Caesar. . . . Jesus himself began to be about 30 years of age." If we omit the word "about," it puts the birth of Jesus at about 2 B. C. We know the date of the accession of Tiberius from the fact that a lunar eclipse (that of September 14, 14 A. D.) is said to have followed the death of Augustus by about a month.

We have read that "there was no room for them in the inn" for the census was being taken and taxes were being collected, and all Jewish men were to go to their home districts to be registered. There is no evidence in Palestine for the dates of these tax collections, but in Angora, Turkey, in 1923, a temple inscription was translated and found to tell that there was such a collection ordered in 28 B. C., a second (during the consulship of C. Censorius and C. Asinius) in 8 B. C., and a third in 14 A. D. (in the consulship of Sex. Pompeius and Sex. Applieius). Unless the collection was delayed in Palestine, this indicates that Jesus may have been born as early as 8 B. C. Other evidence places the date as early as 11 B. C.

We must confess then that we do not know the year of the birth of Jesus. How about the day, or at least the season? We have little evidence on this point. "There were in the same country, shepherds abiding in the field, keeping watch over their flock by night," which would indicate that if these ancient shepherds had the same habits as those of more recent times, it may have been early in the Spring, for it is only then that the flocks are watched at night. The early Christians celebrated the Nativity, the Epiphany, and the Baptism together on January 6. But the Romans had the festival of the Saturnalia to celebrate the time when the Sun has gone farthest south and begins to return December 25 at that time, December 22 now. The period from December 14 to December 27 was a time of good feeling when even the slaves were permitted some small measure of freedom. It was celebrated in Persia as the nativity feast-date of Mithra, the Sun-King, and the Emperor Aurelian, about 275 A. D., designated the date as *Dies Natali Invictus*—the "Birthday of the Unconquerable (Sun)." The Venerable Bede states that to the Angles December 25 was *Madranecht* or "Mother's Night."

A week later the Romans celebrated the Kalends, or the beginning of January, the New Year, with feasting, decoration with evergreens, and exchange of gifts. Gradually this became a very riotous holiday time, as it is yet with us, and the early Christians despaired of a sober celebration of the Nativity on January 6. For this reason, Christmas was separated from the Epiphany and moved back to December 25. It was necessary, however, as late as 729 A. D., for Pope Zacharius to forbid the Kalends form of celebration at Christmas. Various other elements have crept in to make up our modern celebration. Druid worship—the Tree of Life—has come in in the form of the Yule Log. Holland contributes the Santa Claus; as has been noted, the Romans decorated with evergreens.

But what was the Star of Bethlehem? The question is often asked of astronomers, but the answer, which is seldom considered satisfying, is that there is no astronomical record of a star as described literally in the Gospels, but that it may have been one of several phenomena, depending upon the exact date of the birth of Christ. For example, Halley's Comet was visible in 11 B. C., and presented a striking sight as it hung for many nights almost overhead in the neighborhood of the Mediterranean. If we can permit the sign of the coming of the Messiah to have appeared as early as this—if, perhaps, Jesus was born as early as 11 or 10 B. C.—this could have been the Star of Bethlehem. There is also a Chinese record of a comet from February through March, 4 B. C. The use of the word "star" should not be permitted to limit our choice, for in those early days, planets and comets, as well as the extremely distant objects which twinkle in the sky, were called "stars." A planet was a "wandering" star, hence our name for such a body, from the Greek word *planetes,* meaning "wanderer." A comet was a "hairy star" and we get our name for such a body from the Latin word *coma* meaning "hair."

Perhaps an even more transient phenomenon, such as a fire-ball or bright meteor, might have been accepted as the sign.

There are observed, however, "new" stars which burst out suddenly where no star was previously visible to the naked eye. They are not strictly "new," for modern photographs show that such a phenomenon is merely the sudden brightening of a star which was previously inconspicuous. Such a star, as bright as the planet Venus, was seen by Tycho Brahe, the Danish astronomer, on November 11, 1572. One not quite as bright was observed by Kepler on October 10, 1604. Kepler it was who suggested that such an occurrence might have been the Star of Bethlehem.

But another phenomenon appealed to Kepler as a possible explanation for the miraculous star, for in the middle of December of 1603, Jupiter and Saturn had stood close together in the sky and had presented a striking sight. They withdrew from each other slightly, then stood again in conjunction in the Spring of 1604, when a third planet, Mars, joined them.

Kepler possessed the mathematical ability necessary to compute the frequency of occurrence of such close approaches of planets in the sky, and found that it is repeated, for Jupiter, Saturn and Mars, about each 805 years. One previous apparition was in 7 B. C., and this fits fairly well with one of the census-taking dates, delayed by a year or two in Judaea.

The close approach of Jupiter, Saturn and Mars in 7 B. C., and a similar grouping of Jupiter, Saturn and Venus in 6 B. C., occurred in the constellation of Pisces, the Fishes, a sign of the zodiac which was early associated with the destinies of the Hebrew people, as was the planet Saturn. As a matter of fact, the 15th Century scholar, Isaac Abravanel, in his commentary on the book of *Daniel,* entitled *Mayyene Ha-Yeshu'ah,* came to the conclusion that an early conjunction of Jupiter and Saturn in Pisces had preceded by three years the birth of Moses; another such event would precede the coming of the Messiah, predicted by Abravanel for 1503.

These, then, are the choices which the astronomer offers for the Star of Bethlehem—a comet, a meteor, a new star, or a planetary conjunction—but there are those who prefer to believe that it was a miraculous apparition, perhaps visible only to those who were watching for the sign.

Whatever the sign may have been, we are told that "when Jesus was born in Bethlehem of Judaea in the days of Herod the king, behold, there came wise men from the east to Jerusalem, saying, Where is he that is born King of the Jews? for we have seen his star in the east, and are come to worship him."

The Wise Men, or Magi, lived east of Judaea, in the part of the world called Media (now Persia). They were the diviners, astrologers, and priests of the religion of Zoroaster, one of the noblest philosophies man has ever had. The teachings of Zoroaster had foretold the coming of a Messiah, and had related that there would be a sign. The Magi—Kaspar, Melchior and Balthasar—looked for the sign and saw it in the "Star." This led them westward from their homes until they came to Jerusalem, whence they followed the gleam of the Star of Bethlehem. "And when they were come into the house, they saw the young child with Mary his mother, and fell down, and worshipped him: and when they had opened their treasures, they presented unto him gifts; gold, and frankincense, and myrrh."

AMERICAN PSYCHOLOGICAL ASSOCIATION

THE American Psychological Association at its meeting at State College, Pennsylvania, September 5, 1940, approved The World Calendar. The Committee under the chairmanship of Dr. H. B. English and with Dr. E. B. Delabarre as an added member secured the passage of the following resolution:

> The American Psychological Association at its 1940 Annual Meeting joins with other scientific societies in expressing approval of the World Calendar; it urges the national government to take leadership at appropriate time to secure world-wide adoption.

Pirate King has since discovered this fact and condemned Frederic to wait four years more before he can be joined to his loved one!

The plot of the *Pirates of Penzance* suffers in other respects from the introduction of the calendar. A great point is made of the exact hour at which Frederic's apprenticeship ceases. In the opening lines, the king presses Frederic for information on how to make piracy pay better, and on being refused, replies: "Why not, my boy? It's only half-past eleven, and you are one of us until the clock strikes twelve." All that can be inferred from this is that Frederic customarily celebrated his birthday on the 28th of February, and that the play opens on the night of the 27th. It is difficult to see why the "ingenious paradox" should not have occurred to the king earlier in the play.

It has already been demonstrated that the date of the play was 1877, that Frederic was born in 1856, and that the librettist was incorrect in establishing his twenty-first birthday as 1940. Against this, it is argued that Frederic's birth took place in 1852, and that the date of the play was intended to be 1873. If this were the case, then Gilbert and Sullivan would have been correct in saying that Frederic would be 21 in 1940. One line tends to disprove this. General Stanley introduces himself:

> "I can tell undoubted Raphaels from Gerard Dows and Zoffanies,
> I know the croaking chorus from the *Frogs* of Aristophanes,
> Then I can hum a fugue of which I've heard the music's din afore,
> And whistle all the airs from that infernal non-sense *Pinafore*."

The word *Pinafore* was a reference to the previous success, first produced at the Opera Comique on May 25, 1878. Now, even supposing the date of the play to be 1877, the General's reference is already anachronistic—since no one possibly could have been whistling the airs to *Pinafore* until its first production a year later. The General's foreknowledge is excusable on the grounds that he himself was a Gilbert and Sullivan character and that he learned the airs while both he and *Pinafore* were in embryo. But the anachronism is obviously increased, if we set the date of the play at 1873 in order to compensate for Frederic's mistaken maturity.

At any rate, there can be little doubt that, despite the care that must have gone into the construction of the *Pirates,* the complexity of the calendar fooled Gilbert and Sullivan in several ways and was responsible for what is perhaps the only unsound plot in the entire list of their works.

READY-REFERENCE CALENDAR FOR 1941

THE issuance of a ready-reference calendar card for 1940 was so successful that we have decided to print and distribute a new one each year. Similar to last year's yellow card, the new green one depicts The World Calendar with its advantages, and the present Gregorian calendar for 1941 with its disadvantages.

Your copy is attached to this Journal. Additional cards can be secured without cost by addressing a request to The World Calendar Association.

SKY CLOCKS AND CALENDARS

By Professor William H. Barton, Jr.

Executive Curator, Hayden Planetarium, New York City

(From *Sky*, September, 1940)

IT is largely an accident, this measuring of time. Timekeeping is of the earth, earthly. Pick man up and transfer him to Venus, or Mars, or Jupiter, and his clocks and calendars go into the scrap heap. Time, in its philosophical concept, may be universal, but the measurement of time from the practical point of view depends upon where you live.

On Mars the year would contain not about 365 days, but about 687. Those days, moreover, would be over a half hour longer than ours. Surely the Martians would have an even number of hours in their day, so the hour would be longer than ours, *if* they had 24 as we have. That "if" tells us a story. Some time-units, like the hour, are arbitrary, but others, like the length of day or year, are not. You notice nothing was said about "if" in describing the day and year.

On first thought the measurement of time may seem as simple as the measurement of space, but it is not. To measure the length of a room we use a foot rule or yardstick, and by finding how many times that unit of length is contained in the length of the room, we announce the result to be so many feet or yards. Perhaps the foot rule was used nine or ten times in measuring the room. In the measurement of time we cannot use the same unit more than once. We may use the swing of a pendulum to measure a second, but once the second is measured, both the interval and the measuring unit are gone. To measure the next second we must create another unit just like the one that has gone into the past. A timepiece, then, is a device for making uniform intervals of time in constant succession. And that's where the earth comes into the problem. It is so regular in its spinning and its trip around the sun, that it is our best timepiece and all others made by man's hand are ultimately referred to it.

These motions of the earth are most evident to us by changes that we can see in the heavens. We might call them motions of the earth reflected in the sky. The sky is a great clock-face and against it moves an imaginary hand going around once a day. This hand is the meridian, a line running from north to south through the point overhead.

To measure time by the stars let us forget for the moment that it is really the earth rotating, and consider as real the apparent motions of the heavenly bodies. If we watch a certain star tonight as it crosses our meridian and then again tomorrow night, the interval between the crossing is one sidereal day (except for a correction of a small fraction of a second due to precession). This is the kind of time used principally in

astronomical observatories. It has its own hours, minutes, and seconds. Each observatory on a different meridian, such as London, New York, Chicago, and other places, has sidereal time that will agree with none of the others. This might seem confusing until we remember that the difference in time between two observatories is a measure of their distance apart in an east-west direction. That is longitude really, and the scheme offers a very exact method of determining the longitude of various places.

By common agreement, when the Vernal Equinox crosses an observer's meridian he sets his sidereal clock at 0 hours, the beginning of a new day. The hours in this astronomical day are numbered from 0 to 24. There is no a.m. or p.m. as we have in our common clock usage.

Suppose we observe a star crossing our meridian just before the dawn is lighting the sky. And suppose we make this same observation night after night. It is soon evident that the meridian passage, or *culmination,* as it is sometimes called, is coming earlier, well before the dawn. In from one to three months the star is culminating at midnight and in as many more we clock it in the evening twilight.

Evidently this sidereal day is not the sort for practical use. Since its beginning comes at all times of the day and night, its "noon" would do the same. By and large our active life is controlled by the sun. We rest during the night, arise more or less when the sun comes up, and retire again with the coming of darkness. In cities, while we do not live so strictly by the sun, our activities are still largely conditioned by the alternating light and darkness. Before the common use of lighting, as even today in rural communities, the rising of the sun was the beginning of an active day.

So the sun has been used as a timepiece from very early days. The shadow it creates became a clock hand moving over a dial. And thus came the sun-dial. The obelisks of Egypt were no doubt designed for casting shadows, and the Greeks had a similar device. By marking off radial lines about the base, hours and parts could be indicated. Sunrise marked the beginning and sunset the end of the measuring period. This was divided into 12 hours. Since in most parts of the earth the interval between sunrise and sunset is not the same throughout the year, these hours were not equal in length, and are therefore known as temporary hours. By slanting the shadow caster—generally called a gnomon—so that it is parallel to the earth's axis, the hours are made more nearly of equal length throughout the year. The shadow may be cast either on a vertical surface, as in a wall sun-dial, or on a horizontal surface, as in the pedestal dial frequently found on lawns and in gardens.

Just as in the case of star time, every sun-dial has its own meridian and tells only its own local time. A sun-dial is quite satisfactory for many purposes. It is convenient in that it requires no attention, inconvenient in that it will not operate at night nor when the sky is overcast.

If you adjusted your clock or chronometer to keep star time and compared it to sun time, you would discover some strange disagreements. The intervals of 24 hours measured by the stars are regular and of the same length, but those of the sun's crossing the meridian are not. From sun noon to the next sun noon is a variable interval.

There are two reasons for this irregularity. First, the earth is not going around the sun in a circle but in an ellipse, and in this elliptic path it does not maintain uniform speed. When the earth is near the sun, as it is about January 1, its speed is higher than in July when it is most distant. Second, the axis of rotation of the earth is not at right angles to its path of revolution about the sun. Therefore, the sun does not cross the sky on the same daily path. In the north temperate zone, during spring and summer, the sun rises north of east, crosses high in the sky, and sets north of west. Around Christmas it rises far to the south of the east, crosses the south point at noon at a low altitude, and sets to the south of west.

The use of sun-dials for timekeeping became out of date when mechanical timepieces came into use. A clock or watch is designed to run uniformly. The astronomer, therefore, has invented a sun that moves uniformly too. This *mean sun*—so called because it shows the average or mean solar motion—is the one your watch follows. Therefore, your watch keeps *mean time,* and may differ from sun-dial time by a quarter-hour or less.

This difference is called the *equation of time* and is frequently given in almanacs along with other astronomical data. On terrestrial globes it is often shown graphically in a figure 8 arrangement called an *analemma.* The word analemma, originally from the Greek, means support, but in Latin it was a particular type of sun-dial.

Even mean time is not suitable for our present daily use. It is still local time and if we used it without change, each community would have its own time. With railroads and airlines running over long distances and radio linking up all the quarters of the globe, endless confusion would result. When the transcontinental railroads went into operation the first real necessity for uniformity was felt, and *standard time* began in 1883.

By agreement, zones are established and all the communities in one zone use the mean time of a standard meridian. These are 15 degrees apart in longitude or one hour in time. In the eastern United States we all use the time of the 75th meridian, or time that is five hours earlier than London. To the west of this eastern standard time zone another belt uses central time. Mountain time and Pacific time zones complete the United States. But all over the civilized world similar zones give order and exactness to timekeeping.

Time, then, is not such a simple matter. There is star time or sidereal; sun time or local apparent; watch time or mean; and standard time. Regardless of which kind you select it still comes from the sky.

The creeping of the sun around the sky once a year gives rise to a way of measuring the year. When we started to describe star time we began by observing a certain star crossing the meridian in the dawn, and described how this observation would come earlier each night until the star was lost in the early evening sky. After many days, however, that star would again cross the meridian in the dawn. And that would measure a year—at least one kind of year, *sidereal.* Its length as given for 1940 in the *United States Nautical Almanac* is 365.25636046 mean solar days, and if measured in sidereal days, one day more.

This is not the ordinary year, or year of seasons, which is a little shorter, having only 365.24219633 days in it. That is called the *tropical year* and is measured by the sun's shadow. About June 21 the sun is farthest north of the equator and shines from the zenith at noon along the Tropic of Cancer. Anywhere in the Northern Hemisphere its shadow is then shortest for the year, and when it returns to that position again a tropical year has passed—the sun has returned to the same tropic again.

It would seem like quibbling to note the difference between these two kinds of years, which is about 0.01416413 solar days, but it is about 20 minutes and 24 seconds. The Greek astronomer, Hipparchus, noted this in 125 B.C. and could not account for it. For 18 centuries it could not be explained. Sir Isaac Newton discovered it to be due to a curious wobbling of the earth's axis which made the tropics, and the equinoxes as well, move forward a little to greet the coming sun—precession of the equinoxes.

The quarter-day by which each year exceeds an even 365 days has caused a great deal of trouble. No calendar can be made that has an exact number of days in it. There just are not 365 or 366 full days in a year, and there is nothing we can do about it short of altering the earth's motions.

Therefore, our calendars have to be conventionalized along with our clocks. Ordinarily, we have 365 days in the year, but that makes each year about five hours, 48 minutes, 46 seconds too short. This discrepancy has been known, too, for many centuries. The Julian calendar, adopted by a decree of Julius Caesar in 45 B.C., put in an extra day every four years to make up the difference, which was then supposed to be an even quarter-day. But the shortage in a tropical year is less than a quarter-day. Therefore, the Julian year is too long by 8/1,000 of a day—11½ minutes. In the course of 1,000 years the calendar was out by about eight days.

By 1582, the error was about 10 days and a correction was applied by Pope Gregory. Thus in the Gregorian calendar a leap year is omitted every century in the last year of the century, the one ending in "00" (not in "99"), but every 400 years this is put back as a leap year. Therefore 1600 and 2000 are leap years, but 1700, 1800, and 1900 are not.

The moon offers a fair measure of an intermediate unit of time—the month. The word was originally "moonth" or the period of the moon.

While this body is convenient as a timepiece it has its drawbacks. In the old days the lunar month was measured from "the first appearance of the new moon." When that thin crescent was first seen in the western sky after sunset the new month was ushered in with the blowing of trumpets. Between new moons 29 days, 12 hours and 44 minutes elapse, about 29½ days. Therefore, there is not an integral number of lunar months in a year. Twelve such months total about 354 days, which is taken as a year by people who use a lunar calendar, the Mohammedans, for instance.

A strictly lunar calendar gains about 11 days a year on the sun. That is, New Year's Day moves forward a month about every three years, and in 34 years it would go completely around the calendar. This can be adjusted by inserting an extra month in the calendar, at stated intervals. The Jewish religious calendar has an "embolismic" month in it about every three years. Our civic calendar is kept balanced by making the conventional month a little longer than the lunar month.

The week is purely arbitrary, although it does correspond roughly to one phase of the moon. It could be changed to five or 10 days without in any way disturbing the calendar. Our calendar months could be readjusted to better advantage, to keep the quarters of the year equal in length. The World Calendar Association is at present advocating such a readjustment.

LATIN-AMERICAN COMMITTEES

By Charles C. Sutter

GROWTH in the world movement for calendar reform is signalized in a recent decision taken by 15 national organizations comprising the Comite Latino-Americano del Calendario Mundial to continue their work as distinct and independent national committees representing the interest of their own countries and co-equal with other similar bodies throughout the world.

Organized in 1934 by Dr. Ismael Gajardo Reyes, this Latin-American Committee for The World Calendar became the center for coordinative activity of groups and committees in several Latin-American countries. With the passing years additional national organizations joined the Committee until, at the time of Dr. Gajardo Reyes' death, late last year, 15 calendar reform organizations existed in these countries.

The Latin-American Calendar Committee, it may be said, through newspapers, radio, and the spoken word educated the people of South and Central America to the benefits of The World Calendar. It achieved a solidarity of cooperation and approval for this much needed improvement among our good neighbors to the South.

Feeling that the purpose of a coordinating relationship has been accomplished, the national committees expressed their desire that each take its place in the world federation of calendar reform organizations. The World Calendar Association is grateful that they will continue to regard it as the world center for dissemination of material; a center with which all the various committees can continue to cooperate for the simplification of the present unsatisfactory calendar through the introduction of the new World Calendar.

The Chairman of each Latin-American committee has been invited to take his place on the Foreign Advisory Committee of The World Calendar Association, as representative of his country's interest in keeping the torch burning for The World Calendar—one of the constructive and progressive movements in our world today.

LET ALL THE SCHOOL BELLS RING AT ONCE!

By ANNETTE SMITH

Educational Adviser, Council Against Intolerance in America

THE rotating habits of the present-day calendar probably affect the educational world as much as they do any area in modern life. Because the school year sometimes starts during one week in September sometimes during another and therefore closes at different times; because December 25 occurs on a different day of the week each year; and because the length of the school year varies considerably in different states it takes an expert to devise a curriculum that "comes out even."

And that's only the beginning of the troubles caused by the shifting school calendar. Colleges have one time to start and one time to close; public schools have another; private schools have another; and now, since nursery schools have become an important part of American education, they are likely to have another. The National Education Association is besieged with requests every year from people seeking information on starting dates for schools throughout the country. If the calendar were stabilized, every town and city in the country could start on the same day instead of varying from one to three weeks throughout the United States.

But, you say, that could all be avoided by having the various kinds of educational institutions get together to determine the length of the school year, the time of holidays and so on. True they might do it one year, but the whole procedure would have to be repeated the next year because Labor Day falls in the second week instead of the first week in September, because Christmas comes on Saturday instead of Friday and because Easter has confused the issue completely. And as one who has worked on educational committees, I am sure that the whole process of agreeing on school dates would be too unwieldy to attempt more than once. If the calendar itself were uniform the process would be automatically decided.

Let's take a typical family. They're not imaginary. I happen to know them well. Henry Robinson, the father, is a university professor whose classes start at varying times during September and finish at varying times in June. (Of course that's not his real name.) Patricia, the youngest, goes to Nursery School which sometimes starts earlier, sometimes later than father's classes. Robert, an eight-year-old, goes to regular elementary school and his lessons seldom start at the same time as either Patricia's or his father's. Mary, the oldest, is a sophomore in college, but because she wanted to study journalism and her father is in a school of education she chose an out-of-town college that has still a different school year.

The Robinsons have a place in Connecticut during the summer, but the whole tribe has to trek back to the city for Robert's elementary school's start, while the rest of them hang around the city apartment during hot weeks in September until their respective educational institutions get under way. Such a situation does not make for tranquility in the home.

When the founders of Labor Day established this holiday, they did the best they could by making it always come on the first Monday in September. But since the days of schools' starting hinge so much on whether the first Monday is in the first week or in the second, Labor Day's shifting causes great confusion. Some Boards of Education feel that with one day gone there's no use starting until the second week. Others think that four days can be used advantageously to get school affairs organized so they get under way on the first Tuesday. This situation affects school terms throughout the year and all types of schools from nursery schools through the colleges. If the first day of September were standardized as is advocated by The World Calendar Association, Labor Day would automatically fall on the same day each year and schools could establish a starting day that would be the same whatever their grade level and in whatever state they operated. Thus not only would all the Robinsons—Father, Robert, Mary and Patricia—start to school at a regular date each year, but school-going members of all the families throughout the United States would be starting at a uniform time. If the calendar were stabilized, school openings, closings, holidays and examinations could become as stable as the fact that Christmas always comes on December 25.

The Robinsons and their like could all start off at once, could plan a year in advance or five years in advance if they wanted to take a vacation between semesters or during spring vacation and be sure that all the children and the head of the house would be free to vacation together. Mrs. Robinson could know from year to year during what week she should shop for the children's school clothes; the stores from which she buys could predict far enough in advance so that orders could be placed and thus save money for all concerned; and the schools could depend upon a full enrollment when the bell rings after vacation.

Which brings up another point. Because Dr. Robinson's university does not start until late in September and because the country is lovely in September, it is a temptation to postpone the younger children's entry into school. Truth to tell the Robinsons have succumbed more than once with the result that the children are late getting started, have to make their adjustments when the other children are all set to settle down to work, and they pay for a situation which a permanent calendar could easily avoid.

Let's go back to that idea of shopping. Stores go to considerable trouble to obtain the school calendar of all schools in the community. Since schools do not make up calendars until late in the previous school year,

stores frequently do not know until some time in June at what time the majority of schools are going to start in the fall. So sales for school clothes and material are hard to schedule. If schools started at a uniform time every year as they would in the proposed new calendar, the department store could place orders far ahead for advantageous sales the week before school starts in September. The buyers would know from year to year during what week to stage their school sales instead of jumping about throughout all of September's four as they are now required to do. Mrs. Robinson could know that The College Shop opens to outfit her college sophomore during the same week that the store has a fresh selection from which to outfit the nursery scholar with corduroy pants and abbreviated ginghams and the older boy with whatever an eight-year-old demands.

One could go on and on listing the inconveniences to families with children in school under the present calendar set-up; the difficulties in making a curriculum with school dates so elastic, the complications of bookkeeping when pay-days come at varying intervals, the difficulty in school purchases and the effect on many other activities and services—but that's another story. I've tried to tell what benefits the new World Calendar will bring—the disadvantages of the present one are obvious.

DR. GUSTAVUS AUGUSTUS EISEN

By CHARLES C. SUTTER

Director, The World Calendar Association

DR. GUSTAVUS AUGUSTUS EISEN, archaeologist, biologist, and writer, died in New York on October 29. In spite of his 93 years, Dr. Eisen maintained a constant interest in the calendar, its history and reform.

A member of The World Calendar Association for more than four years, he contributed an interesting study of the Mayan calendar to the *Journal of Calendar Reform* in 1938. It appeared under the title, "Wheels Within Wheels." In describing this ancient method of reckoning time, Dr. Eisen said: "The Mayan calendar was literally a case of wheels within wheels—a mathematical clockwork that ticked off the days, years, and centuries. It was an incredibly intricate system, but it worked with absolute accuracy. The people who devised it had a passion for numbers, and the calendar was their great masterpiece. As a piece of astronomical calculation it is utterly without equal."

Born in Stockholm, Sweden, on August 2, 1847, Dr. Eisen received his education abroad. In 1873 he received a Ph.D. degree from the University of Upsala, Sweden, and had a remarkable career in archaeological research, travel, and authorship. Dr. Eisen's researches concerning the Chalice of Antioch, reputedly the Holy Grail, or cup of Christ's Last Supper, made him famous. He was the originator of the Sequoia National Park, made many archaeological explorations to Mexico and Central America, and continued his archaeological explorations in connection with antique glass and Christian Archaeology in Spain, Italy, Algiers, Tunis, Morocco, and Egypt.

He was the author of more than 100 books and papers, including such diversified monographs as *Mesopotamian Cylinder-Seals* and *The Legends of the Holy Grail*, and his earlier writings included *Portraits of Washington, Glass-Antique Glass—Its History and Classification, The Fig*, and *The Raisin Industry*.

Dr. Eisen was a member of many learned societies in America and Europe.

PROBLEMS OF THE CALENDAR

By Professor W. L. Kennon

University of Mississippi

In general, problems of the calendar fall into two distinct classes. First, those arising out of the attempt to use two, or more, incommensurate astronomical, or natural, units of time. Second, those due to the use of arbitrary sub-divisions of the natural units.

THE PROBLEM OF COMMENSURABILITY

The three natural units, or intervals, that have been used most extensively for the purpose of constructing calendars are the tropical year, the lunar month, and the solar day. If only one of these natural periods* of time is incorporated in the calendar, the problem of commensurability disappears; for any arbitrary multiple or sub-multiple of the natural period chosen might be adopted for the purpose of expressing longer or shorter intervals. For example let us suppose that we adopt the solar day (in practice the mean** solar day); then longer intervals could be expressed in terms of multiples of this unit without reference to the year; or to any other natural interval, such as the lunar month. The interval say, of 1,000 days, might then be employed for longer periods and given a name such as the kiloday. Obviously such an arrangement would be highly objectionable since it would completely ignore the seasons.

On the other hand, if we adopt the tropical year as the basis and divide it into some integral number of arbitrary sub-divisions, we could, of course, likewise avoid the problem of incommensurability, but we would be forced to ignore the day as an element of the calendar. This would be even more objectionable than having to ignore the year; for verily we live day by day. Thus no calendar could meet our requirements that did not include as essential elements the solar day and the tropical year.

It is, then, very unfortunate for purposes of calendar building that the tropical year and the mean solar day are incommensurate; that is to say, that there is no integral number of mean solar days in a tropical year. Measured in terms of (mean) solar days the length of the tropical year is very approximately 365.2422 days (365 days 5 hours 48 minutes 46.15 seconds).

Obviously, a practical calendar that employs these two incommensurate

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* For the present purpose it is not necessary that we raise the question of the variability of the lengths of these natural intervals. This feature is of some importance, however, and will be considered at the proper place.

** The mean solar day is the average of the true solar days (which vary in length) throughout the year. There are, therefore, exactly the same number of mean (or average) solar days in a year as true solar days.

natural units can only be perpetuated by "patching it up" from time to time, by the addition or deletion of one or the other of the units employed. This procedure is called *intercalation.* Essentially, the expedient of intercalation in practice amounts, first, to substituting for one of the natural units or intervals an arbitrary interval so chosen as to be approximately equal to one of the natural intervals, and so as to be commensurate with the other; and second, to compensating for the accumulated difference between the length of the natural interval (which serves as the natural basis), and the approximately equivalent arbitrary interval (which serves as the practical basis) by the addition, or deletion, of one of the units when the "accumulated difference" becomes nearly equal to one of these units. An illustration will help to clarify this procedure.

The Julian calendar substitutes an arbitrary, or "Julian year" of exactly 365.25 mean solar days, for the natural, or tropical, year of 365.2422 days. The Julian calendar year thus comprises exactly 365¼ mean solar days. It is, therefore, 11 minutes and 14 seconds longer than the tropical year. The Julian calendar made no provision to compensate for this excess, which amounts to about one day in about 128 years. The Julian calendar was inaugurated in 45 B. C., and, if no adjustments or revisions had been made in the meantime, the date (or day of the year) would now (1940) be displaced with respect to the date on which a given season (say the Vernal Equinox) occurred when the calendar was first instituted, by a period of 13 days. However, even by the end of the 16th Century this feature of the Julian calendar had become quite objectionable. For example, the Council of Nicaea in 325 A. D. "fixed" the date of Easter as the first Sunday following the full moon which occurs on, or immediately after, March 21, which was the date of the Vernal Equinox of that year. By the end of the 16th Century the equinox had regressed in the calendar until it was occurring around March 11. The ecclesiastical importance of the date of Easter, as well as of the dates of other church festivals was such that this seasonal displacement became a matter of consequence. Accordingly, in the year 1582 Pope Gregory XIII, with the advice of the astronomer Clavius, proposed a revision, or adjustment, of the Julian calendar with a view to restoring the original date of the Vernal Equinox, and to providing against a future repetition of its seasonal displacement. The original date of the equinox was restored by suppressing 10 days from the calendar. This was put into effect by proclaiming that October 5 of the year 1582 should be designated October 15 of the same year. Having restored the date of the equinox, it was next required to provide against the recurrence of such an embarrassing contingency.

This historic instance of calendar revision is introduced here not only for the purpose of illustrating the problem of incommensurability, but also to call attention to the really serious aspects of calendar defects and reforms from the point of view of human society. The calendar may be an interesting puzzle to the astronomer and mathematician; but we must not overlook the fact that it also has chronological, ecclesiastical, legal, and commercial aspects that are of far more concern to human society than is a mathematical puzzle. Indicative of the first aspect mentioned, it is said that a great Assyriologist, who had devoted many years of study to ancient dialects in preparation for his work, once remarked that it would have facilitated his researches much more had he spent this time studying ancient calendars.

Before entering upon that aspect of calendar revision which proposed to provide against the displacement of the seasons with respect to the calendar, we must first call attention to the device of the Julian calendar for taking care of the circumstance that the number of solar days in a Julian year, though commensurate, is not an integral number. This was cared for by the so-called leap-year rule. The first calendar year was concluded and a second year begun with the completion of the 365th day. Thus the sec-

ond calendar year was begun one-quarter day before the calendar year was completed. If this had not been done, the time of the beginning of the day would have been advanced six hours in the day in each successive year. For example, if instead of concluding the year say at midnight of the 365th day, the calendar year had been allowed to run to its full fruition of 365¼ days, then the first day of the following year would necessarily have begun at 6 A. M. instead of at midnight as in the previous year. The days of the third consecutive year would begin at 12 o'clock noon, et cetera. To avoid this confusion and inconvenience the "leap year" was included as an integral part of the Julian calendar. That is to say, the first three years of each four-year series (the so-called Julian cycle) carried 365 days each, and to the fourth year of the series was added an extra day, making the "leap year" of 366 days. This day was attached to the month of February, giving it 29 days in the leap year instead of the usual 28 days of ordinary years. This device, it will be noticed, does not affect the average length (365¼ days) of the Julian year over the four-year cycle. It does, however, upset the symmetry of the calendar year, and introduces other objectionable features to an ideal calendar; but more of this later.

Let us now return to the matter of revising the Julian calendar so that the calendar year may more nearly equal in length the tropical year, which fundamentally is the basis of the Julian calendar. As noted above, the excess of the Julian over the tropical year is 11 minutes 14 seconds, and amounts to one day in very nearly 128 years, or to about three days in 384 years. To compensate for this excess the Gregorian calendar omits three leap days in 400 years. This was done by providing that century years (which according to the Julian calendar are leap years) shall not be leap years unless their numbers are divisible by 400, in which case they remain as leap years. Thus, the Gregorian calendar omits three leap days in each 400 years from the Julian calendar, rather than three leap days in 384 years (about). These three "leap days" were omitted from the century years whose numbers are not divisible, without remainder, by 400. According to the Gregorian calendar, therefore, the century years 1700, 1800, and 1900 were common years; whereas, the century year 2000 will be a leap year. This rule reduces to 25.92 seconds per year the average difference between the length of the tropical year and the average length of the Gregorian calendar over a period of four centuries. At this rate it will require some 3,300 years for the calendar date to become displaced one day with respect to the equinoxes; or in other words, with respect to the seasons. The Russians continued to use the Julian calendar until 1918 at which time they adopted the so-called Eastern calendar according to which "century years shall be leap years only in case their numbers when divided by nine give a remainder of two or six." This rule reduces the average difference between the calendar year, and the tropical year to three seconds, and will, therefore, require an interval of about 29,000 years for a difference of one day to accumulate between the calendar and the seasons. The statement of the rule may be a little difficult to remember, but fortunately it does not need to be applied often. The Gregorian and Eastern calendars now agree in date, but will differ by one day after 2800 A. D.

Professor T. A. Bickerstaff, of the University of Mississippi, a student of the calendar, suggested the rule that every year divisible by four be a leap year excepting years divisible by $2^7 = (128)$. This reduces the difference between the calendar year and the tropical year to less than one second and would require about 90,000 years for one day to accumulate!* Besides the rule's precision and simplicity it is enhanced by the manner in which it employs the venerable calendrical numeral of seven.

So far then as the problem of commensurability between the mean

* If this rule were put into effect on a year divisible by 128, such as 1920, 2048, etc., the present succession of leap years would not be disturbed until the year 2000, which year would be a leap year according to the Gregorian calendar but would not become a leap year under the new rule.

solar day and the tropical year is concerned there appears to be little more that can be done, or at least that needs to be done.

THE PROBLEM OF ARBITRARY SUB-DIVISIONS OF THE CALENDAR

For many purposes the mean solar day is too short a time interval and the tropical year is too long. The need of calendar divisions of intermediate lengths has been felt from the earliest times. The week of seven days even antedates any established calendar. The seven-day week is, indeed, one of the oldest and most firmly established institutions of human society. The seven-day week for all its hoary age and persistence was not, however, universally used by ancient peoples. Alexander Philip in his scholarly little book *The Calendar* refers to the seven-day week as follows: "The seven-day week is of Semitic origin. Traces of it are to be found among Chaldean, Egyptian, and even Greek records. But it was among the Jews that the seven-day week was fully developed, and it is from them that its observance has spread over, and now so largely dominates the civilized world."*

The question of the origin and history of the seven-day week is most interesting, though our necessary limitations of space do not permit its discussion here. Seven was held in high esteem as the "perfect number" by ancient philosophers and mystics; the seven days of creation of *Genesis;* the seven wanderers of the sky, or "planets," as known to the ancients (the Sun, the Moon, Mercury, Venus, Mars, Jupiter, and Saturn); the seven wise men of Greece; the two seven wonders of the world; the seven seas; the seven ages of man (Shakespeare); et cetera, all witness to early and persistent use of this "perfect" number. There is, however, no exact astronomical basis for the seven-day week any more than there is, say, for a ten-day week. A seven-day period is only roughly a fourth of the lunar month (29½ days). A ten-day period is, for instance, much more nearly a third of the lunar month.

The immediate point at issue, however, is that the seven-day week is not an integral factor of the calendar year. There are 52 seven-day ($52 \times 7 = 364$) weeks plus one day in ordinary years, and 52 weeks plus two days in leap years. Thus the annual form of the Gregorian calendar only repeats itself, cyclically, after 28 years, in the sense that the same day of the year falls on the same day of the week. This illustrates a difficulty of calendar construction inherent in the selection of arbitrary sub-divisions. It must not be overlooked, however, in this connection that any arbitrary choice of sub-divisions of the year is complicated by the necessity that sub-multiples of the year must likewise be multiples of the day.** This is just another of the insidious difficulties in the use of two incommensurate natural units (the day and the year) in the calendar.

Another arbitrary number that appeared early in calendar notation, and which is now well-nigh universal, is the number 12. Much might be said*** of the useful properties and distinguished history of this "noble" number; but here again necessary limitations forbid. Twelve may be divided integrally into halves, thirds, quarters, sixths; it contains two pairs of integral factors 3 x 4 and 2 x 6. The sheer usefulness of this facile number, according to Mr. H. G. Wells,**** commended it to the culture even of Neolithic

* *The Calendar,* by Alexander Philip, p. 29. Cambridge University Press.

** The month of the Gregorian calendar, of which there are 12 contained in the year, cannot be one-twelfth of a year because of the requirement that the month be a multiple of the day. Furthermore, a month of this character could not be a multiple of the seven-day week.

*** See *The Romance of the Calendar,* Chap. 7, by P. W. Wilson, W. W. Norton and Co., Inc., New York, 1937.

**** See *Outline of History,* by H. G. Wells.

man. With the dozen of 12 units, the foot of 12 inches, the day of twice 12 hours; what could be more appropriate and convenient than the year of 12 months? But when we note that, although the year contains exactly 12 months, the month is, nevertheless, not one-twelfth of the year, we begin to realize the true obstinacy of calendar arithmetic, and begin to forego hope of a perfect solution of this stubborn problem.

Again, too, we are confronted by the lack of integral commensurability of the two sub-divisions, the week and the month; not to mention the inequalities of the several months. There are 12 inches in every foot, and three feet in every British yard. There are twice 12 hours in every mean solar day, and each hour is equal to every other. But among the sub-divisions of the year which we have to divide and multiply, add and subtract, quite as often as we do the divisions of the yard and of the day, no such order and simplicity prevail; nor can any such order and simplicity ever prevail in any calendar that is based upon both the daily and the annual motions of the sun, as must depend any natural calendar that is to meet the requirements of human society. Even in this extremity there is a theoretical possibility that should not be overlooked in a discussion of this sort. Just as we have an arbitrary week that is an exact multiple of the day without reference to the month, so we might have a month that is an exact sub-multiple of the year (say one-twelfth of a year) without reference to the day. This is in principle, but not in practice, what we have in our modern calendars. As everyone knows we have 12 months in the year, but if we correlate the month integrally with the day, then the month cannot be one-twelfth of a year. But if we were to forego this correlation, of course, there is no reason why we could not divide the year into 12 equal months. In practice this would be equivalent not only to setting up two distinct calendars but would also require in practice a separate time service for each. For instance, we would require a clock with a "short-hand" that would make one revolution, say, in a tropical year; and a "long-hand" that would make one revolution in a month of one-twelfth this length, or make exactly 12 revolutions in a year. Such a clock would indicate at any time the progress of the year in months and fractions of a month, but would not indicate directly, or in any simple integers, the progress of the year in weeks or days. Such a procedure, while it would provide an exact 12-fold division of the year and solve the difficulty of a 12-month year, would do so only by ignoring the day and the week as sub-divisions of the year; which again illustrates the statement we made at the outset that the difficulties of providing arbitrary sub-divisions of the calendar resided in fact in the use of two natural units, and that these difficulties would disappear only when we confined the calendar to one such natural unit. However, even the numerical simplicity of such an expedient has little weight in the face of the reality that we live not only by the day, but as truly by the year as well. Once being reconciled to this reality, we can turn our attention more complacently to another, namely, that of making the best bargain we can with the arithmetic of a double standard calendar.

Having outlined the problems that are to be encountered in calendar construction, let us now examine the present form of the Gregorian calendar in the light of the principles that have been set forth with a view to evaluating the bargain that has been struck. First, we note that the present calendar is not "perpetual" in the sense that it preserves the same form from year to year. This feature of our calendar is too unpleasantly familiar to require comment. Indeed, the same day of the week does not fall cyclically on the same day of the month, but once in 28 years, thus necessitating the preparation of a "new" calendar each year. This comes about because of the integral incommensurability of the week with the year, and with the month. There are 52 weeks plus one day in ordinary years, and 52 weeks plus two days in leap years. Thus the day of the week is advanced one day in the month each successive (ordinary) year, and is advanced two days in leap years. If there were no leap years the present calendar would repeat itself after seven years, but the intervening leap year upsets this cycle and postpones the recurrence for a period of $4 \times 7 = 28$ years. This period is known as The Solar Cycle.*

* There are thus seven ordinary year calendars, and likewise seven leap-year calendars. That is, there are seven calendars of 365 days, one beginning with each day of the week; and

Several of the current proposals for the revision of the calendar undertake to cure this difficulty by omitting the extra day (or two days, as the case may be) from the tabulated form of the calendar, designating these days by some special notation, as for instance December Y (Year-End Day), and June L (Leap-Year Day) in the case of "The World Calendar." The 13-month calendar meets the situation in a similar manner. By this device the calendar may be made "perpetual" in the sense that the same tabulation may be used for successive years. According to this arrangement the same day of the week would fall on the same day of the month in successive years, but would not necessarily do so in successive months of the same year. This, of course, could not be the case if we adhere to the 12-month year. It would be possible with the adoption of 13 months of 28 days each (13 x 28 = 364 days) as proposed in the 13-month calendar. The same result could be accomplished by dividing the year into four divisions (or quarters) of 13 weeks each, and in other ways. However, we are considering here only the question of a "perpetual" form of calendar.

SYMMETRY OF THE CALENDAR

If we attempt to divide the year of the present calendar into quarters of three months each we find that the first quarter (January, February, March) contains 90 days,* the second quarter (April, May, June), 91 days; the third quarter (July, August, September), 92 days; the fourth quarter (October, November, December), 92 days. If we attempt to divide the year into thirds of four months each, we have the periods 120 days, 123 days, 122 days. If we divide the year into halves of six months each, we have 181 days and 184 days.

Thus the calendar, although based in principle upon a 12-fold division is, nevertheless, not symmetrical with respect to any of the multiples of 12. Once the 365th, or odd day, is eliminated in the tabulation, as has been suggested in order to render the calendar perpetual, the symmetry of the calendar can easily be accomplished by merely rearranging the numbers of days in the 12 months. This is done in The World Calendar and in the 13-month calendar. The former adheres to the 12-month division, each quarter of which contains 91 days; and, of course, the two halves of the year equal 182 days each. The calendar based upon 13 months is not divisible into quarters and halves in

seven calendars of 366 days, one beginning with each day of the week; making a total of 14 calendar arrangements. Ordinary year calendars repeat themselves in yearly cycles of 6, 11, 11, 6, 11, 11, 6, 11, 11, 6, etc.; whereas leap-year calendars repeat themselves in cycles of 28 years. Since one of the ordinary year cycles (6, 11, 11) = 28 years, it follows that the 28-year Solar Cycle includes all of the 14 possible forms of the Julian calendar. Because 100 is not divisible by 28 without a remainder, and because century years are not leap years except every fourth century, it follows that the same succession of calendars cannot be correlated with the same years of the century within a shorter period than 2,800 years, which is the least common multiple of 28, 100, and 400 years. June 20, 1940, occurred on a Thursday. June 20 will not again occur on Thursday on the fortieth year of the century until the year 4740, or not until after 28 centuries, Gregorian calendar. For the further correlation of the years of the Julian and of the Gregorian calendars with this sequence the reader is referred to *The Perfect Calendar*, by Henry Fitch (Revised Edition), Funk and Wagnalls Company, New York.

* 91 days for leap years.

terms of months, but instead gains a perfect symmetry for the month measured in weeks and days, each day of every month falling on the same day of the week. Also the year and the month are perfectly symmetrical with respect to the week.

Here, then, as in all other problems relating to the numerical arrangement of the calendar, it is largely a matter of compromise, and in the final analysis, a choice between several arrangements; a choice that will depend upon which alternative offers the most in meeting the many requirements of a practical calendar.

EPOCH, OR THE WHEN?

Time-keeping systems are required to answer two distinct questions, namely, "How long?" and "When?" The first of these calls for an interval, such as a day, a week, a year, et cetera; the second, for an epoch such as 12 o'clock noon January 1, 1938.

In our discussion thus far we have emphasized the "interval" in calendar construction. Now we shall consider briefly the epoch. There must be some agreement as to when and where the day and the year shall begin. This question is usually considered under the discussion of the Civil Time System, but the fact that the question arises here merely emphasizes the integral connection between time-keeping and the calendar. Obviously, the day might be regarded as beginning at any point in the course of the diurnal rotation of the mean sun. It is agreed, however, that the day at any place shall begin the instant that the mean sun crosses the local anti-meridian of the place, *i.e.*, at local midnight. A given date, however, first appears on the earth at the instant of midnight on the 180th meridian, or, what is equivalent, at Greenwich noon. This, of course, according to current and proposed calendars determines in general when the year shall begin, *i.e.*, at Greenwich noon. But what Greenwich noon? Obviously, the year might be begun on any Greenwich noon, as for instance, on the noon nearest the Spring Equinox, or the noon nearest the Summer Solstice, or at any other Greenwich noon. Another basis would be to begin the year at the Greenwich noon occurring nearest the instant that the earth passes the perihelion, or aphelion, of its orbit, et cetera. In the Julian calendar, for instance, the year was begun originally about a week after the Winter Solstice, which corresponds approximately with the perihelion passage. This was arbitrary on the part of the inaugurators of this calendar. It would have seemed more logical to have correlated the epoch of the year more exactly with the astronomical seasons, as was done in the Jewish calendar, which began the year with the Autumnal Equinox.

CHRONOLOGICAL ERAS

The serial number of a year determines the era of the calendar. It signifies the time, or epoch, when the enumeration, or count, was begun.

For example, the current year is the 1,940th year of the Christian Era; the 2,693d year of the Roman Era, the 2,600th year of the Japanese Era. The 1,359th year of the Hegira, or Mohammedan Era, began at sunset on February 9, 1940. The 5,701st year of the Jewish Era began at sunset on October 2, 1940, et cetera. These numbers imply a point of beginning from which chronological time is counted. This point of beginning may be any unique event or occurrence, whether real or fictitious. It may be some chance event of human history; or some naturally ordered event, such as an eclipse of the sun, or some conjunction of the planets, et cetera. The eras just mentioned take their origin from historic or legendary occurrences. The Jewish Era counts from the supposed date of creation; the Mohammedan Era, from the flight of the prophet; the Roman Era, from the founding of Rome; the Christian Era, from the birth of Christ,

et cetera. Eras, since they are based upon unique events, are distinguished from cycles in that eras are non-recurring. A series of cycles, however, might be made the basis of an era. An interesting example of this is the so-called Julian Day Number.

THE JULIAN DAY NUMBER

Joseph Scaliger was responsible for the introduction of the plan of numbering the days consecutively without reference to calendar notation. Thus the Julian Day Number corresponding to January 1, 1940, was 2,429,630. So we may accordingly ask, 2,429,630 days since when?

In the year 1582 Scaliger announced a comprehensive cycle known as the Julian Period which is a common multiple of the 19-year Metonic Cycle; the 28-year Solar Cycle; and the 15-year Roman Indiction. He found that these three latter cycles when carried back had a common beginning in the year 4713 B. C. (Julian calendar). He thus fixed the date January 1, 4713 B. C. as the beginning of his period which will not be completed until the year 3267 A. D. We may thus consider the Julian Day Number as the specification of a date in an era which began January 1, 4713 B. C., the beginning of which is established by a natural order.

Even though we may achieve perpetuity and numerical symmetry of the calendar by the use of arbitrary expedients we must not overlook the fact that the tropical year is itself inherently unsymmetrical. The four astronomical seasons even are not of equal duration. The spring season (from the Vernal Equinox to the Summer Solstice) is 92 days, 19 hours, 14 minutes in length. The summer season (from the Summer Solstice to the Autumnal Equinox) is 93 days, 15 hours, one minute. The autumn season (from Autumnal Equinox to Winter Solstice) is 89 days, 19 hours, 12 minutes; and the winter season (from Winter Solstice to Vernal Equinox) is 89 days and 21 minutes. The half of the year from the Spring Equinox to the Fall Equinox is, therefore, seven days, 14 hours, and 42 minutes longer than the half of the year from the Fall Equinox to the Spring Equinox. This is of little consequence, however, from the viewpoint of the civil calendar; and fortunately the astronomer is prepared to take care of his peculiar requirements in matters of this sort.

CHRONOLOGY AND THE CALENDAR

In dealing with periods longer than the year, and particularly when many centuries are involved, it is somewhat difficult to determine the interval between two widely separated dates in the present, or in proposed calendars, because of the necessity of keeping track of intercalated, or untabulated days. For this purpose various cycles have been devised.

A cycle is the least common multiple (approximately) of two, or more, incommensurate units of a calendar. For example, the Solar Cycle, of 28 years, determines the recurrence of the same day of the month on the same day of the week. Thus in the year 1938 the seventh day of October fell on Friday. The seventh day of October will again fall on Friday in (1938 + 28) 1966, in (1966 + 28) 1994, et cetera. In other words the same day of the week and month recurs every 10,227 days (unless a century year, divisible by 400, intervenes). The chronological aspect of the calendar is of little consequence in civil life, and specialists in this field have their own techniques for handling the problems that sometimes arise. The Julian Day Number affords a very convenient way of specifying an epoch especially for astronomical purposes. If the Julian Day Numbers of any two epochs are given, in order to find the intervening interval in

mean solar days it is merely necessary to subtract one of these numbers from the other.

If there were any real need for longer intervals than those already mentioned, other cycles might readily be obtained from the various astronomical periods. For instance, the period of the precession of the equinoxes, 25,800 years, might be mentioned. The geologist is, of course, confronted with time intervals of still greater orders of magnitude. The examination of the geologic time scale, in the light of what has been said, has many interesting aspects; but this lies beyond the scope of our proposed discussion. With the ever-expanding domain of the observable universe we may in the none too distant future be confronted even with the need of a Cosmic Chronology.

CRITERIA AND CONCLUSIONS

In concluding the first part of this discussion dealing with the problems arising out of the incommensurability of the solar day and the tropical year, we had occasion to remark that there appeared to be little, if anything, more that really needed to be done to bring the current calendar into harmonious agreement with the natural cycles on which it is founded; that is, with the solar day, the tropical year, and the seasons. Regarding the second part of the discussion dealing with the problems arising out of the arbitrary choice and arrangement of the multiples and sub-multiples of these basic units, it is quite apparent that the calendar presents no such happy status. We must not on this account, however, jump to the conclusion that even in this latter category the current calendar is *all* wrong.

Primarily the calendar is a document to live by, and secondarily, a system of bookkeeping; though we will all agree, other things being equal, that the simpler the bookkeeping the more it will contribute to the pleasure of living. Keeping these two aspects in mind, and giving due weight to each, let us examine the current calendar with a view to cleaving to that which is good and to making the most sensible bargain with that which is bad. We think this procedure, in the light of what has been said, will lead in the first place to very definite and convincing decisions, and in the second place show that the task of arranging a satisfactory calendar with all of its inherent difficulties is in fact a very simple and obvious matter. This is because the major difficulties of the problem have long ago been solved and there only remain a few adjustments.

As to the desirability of the seven-day week and the 12-month year, there can be no dispute. These, as has been pointed out, are among the oldest and best established institutions of human society. If a satisfactory calendar is one that shall harmoniously correlate the affairs of man with the cycles of nature, what better criterion of merit can be found than a record of successful accomplishment covering the entire span of man's recorded history? The very fact indeed that the world's greatest literature, "the noblest record of its achievement," (to borrow a phrase from the great Laplace), is itself a convincing argument for not upsetting the noble order of the past as expressed in seven and 12-fold divisions. We must, therefore, retain the seven-day week, and the 12-month year. What next? Hath the poet Dryden not written:

> "Perceiv'st thou not the process of the year,
> How the four seasons in four forms appear
> Resembling human life in ev'ry shape they wear?"

And perceiving the four seasons as they are ordained in the heavens and upon the earth, shall we not give them their rightful symmetry in the calendar? This means that the four seasons must be identified not only with the four quarters of the year but also with the months, for each month has come to have an individuality in relation

to the seasons as distinct as the individualities of the days of the week. This sentiment is feelingly expressed in the opening verses of Chaucer's "Prologue":

"Whan that Aprille with his shoures sōte
The droughte of Marche häth perced to the rōte,
And bathed every veyne in swich licour,
Of which vertu engendred is the flour;"

It would be about as sensible or rather as non-sensible to upset this established simplicity of the 12-month, four-season correlation which includes the seven-day week as to attempt to introduce another month or to subtract a month. These simple adjustments are admirably provided for in The World Calendar. Three days are shifted with respect to the months and one day is presented as a world-holiday, tabulated as an extra day, and the trick is done. The ancient order is preserved, a symmetrical arrangement of days, weeks, and months with respect to quarters and to the whole year is secured. The calendar becomes simple in structure, permanent in form.

"But," you ask, "what about the extra tabulated days?" Just this, they are the gift The World Calendar offers man by which the tremendous advantage of stabilizing the future order is achieved without relinquishing the proven groundwork of the past. The situation is somewhat like that of the weather; we talk a lot about it, but we are helpless to do anything about it. Thus so long as 365 is not divisible by either seven or 12 without a remainder, we have our choice of accepting an extra tabulated "gift-day" or a non-repeating calendar. Once we become reconciled to the idea of Year-End Day and accustomed to the practice, the novelty of this device will soon become commonplace. The year will still contain 365 or 366 days, as the case may be, and the same rules will still apply in determining their sequence. In The World Calendar it would seem to the writer that logic and good sense have spoken. One thing only remains to place the calendar abreast the advancing front of civilization, and this alone is the real problem of the calendar. It is agreement.

RÉSUMÉ

In this space we have attempted to make it clear that the problem of time-keeping, and of time bookkeeping, is fundamentally one of correlating human history and the occurrences of Nature with the movements of the heavenly bodies. We are not, however, overlooking the future possibility of using physical, chemical, or even biological* processes for this purpose. We are, however, attempting to emphasize the important role that has been played in the past, and that is being played at present, by astronomical science in meeting these fundamental requirements of human society, as regards an adequate time-system and calendar.

* The writer is not advocating a biological calendar, nor is he taking an opportunity to exploit a hobby; yet for the benefit of those who may regard such a possibility as entirely ridiculous, he would mention the periodic migrations of the swallows of the old San Juan —Capistrano Mission of Southern California. Annually for 68 years these birds have departed the Mission about noon of October 23 to return just as meticulously on the 19th of March following. This is, of course, not an isolated instance of periodic migration. It has been suggested, were the older birds destroyed prior to the established date of migration, that the fledglings would just as surely depart on schedule. This "faith" is founded on an inherited instinct, an ancestral trait, established by a law of nature perhaps no less mutable than the law of gravitation.

A NEW GERMAN CONTRIBUTION

Reviewed by the Reverend Edward S. Schwegler, D.D.

IMMERWAEHRENDER NEUKALENDER, *von J. B. Achatz*
Neka Verlag, Straubing, 1939

SOME time ago the *Journal of Calendar Reform** carried a review of another book by this same author: *Allgemeiner Neukalender* (Straubing, 1937). Herr Achatz is evidently a Catholic, since the present work, like its predecessor, bears the *Imprimatur* of the Vicar General of Regensburg, or Ratisbon. Further, an insert in this work reproduces a letter dated August 5, 1937, from the Papal Secretary of State, now the reigning pope, Pius XII. The letter acknowledges the receipt of the writer's previous publication, and grants the apostolic benediction to the writer himself. Such an acknowledgment, of course, can hardly be taken as an official approbation of the ideas set forth by the author. How many books are sent to the Holy Father in the course of a year, and how many of them he is able to read and give his direct and personal approbation to, may well be a matter of conjecture.

The present work is rather unique. The 12 initial pages contain a "perpetual calendar"—a page for each month. Each page has 11 columns, which give successively the following data: 1. Position of the Day in the Year; 2. Lunar Day; 3. Epact; 4. Roman Date; 5. Julian Date; 6. Gregorian Date; 7. Reformed Date; 8. Dominical Letter; 9. Position of the Sunday in the Year; 10, 11. Sundays and Feasts of the Church Year.

With each of these headings as a starting point, the author gives in succinct form all the essential information that the student of the calendar should possess. He also presents a number of formulae and tables.

The reformed calendar which Herr Achatz proposes has already been referred to in these pages as a sort of World Calendar without supplementary days. The first three quarters of the year would have 31, 30, 30 days, and the last 31, 30, 31, except that in leap year the second quarter would also have 31, 30, 31 days. This would give a pattern for the quarters of 91, 91, 91, 92 days in ordinary years, and 91, 92, 91, 92 days in leap years: a really quite symmetrical arrangement. But fixed dates would still wander through the week, so that the great goal of real and absolute fixity would still be far in the distance. As before, Herr Achatz distinguishes between two kinds of "movabilities" in the calendar. The first, or "normal" one, is confined to seven days, and is the kind possessed by all feasts with a fixed date, or with a certain day in a fixed week. The second, "abnormal movability," has a possible variation of 35 days, and is based upon the changing date of Easter.

It would be the aim of the author to remove the "abnormal movability" of feasts from the calendar and to substitute or retain only the "normal movability." He delineated his plan in his previous work, but in the newer book he makes some observations that are interesting. Logically, he maintains, all feasts of the year should shift only within the limits of the week because the year as a whole, beginning with the first Sunday of Advent, does not shift outside these limits. Then, the great feasts of Our Lord should parallel the first Sunday of Advent and so should be placed on Sunday, except where very definite reasons require another day (e. g., Ascension *Thursday*).

* Vol. VIII, pp. 162 *sqq.*

We then should have Christmas coming on the Sunday after the fourth Sunday of Advent, or on the last Sunday of December, the Circumcision on the first Sunday of January, the Epiphany on the second Sunday, and the Purification (February 2) on the fortieth day after Christmas. Easter in like fashion would be on a definite Sunday—the fifteenth after Christmas, or (the same thing) the fifteenth Sunday of the year. It could then only vary from April 8 to April 14. Similarly, Pentecost, Trinity and the other Sundays changing with Easter would move only within the limits of seven days.

Now let us see what The World Calendar would do along the same lines. Christmas in the latter, instead of always falling on Sunday, would fall on Monday, thus producing the double civil holiday which has so many advantages, and making the first of them a preparation for the second. Further, Christmas would always be December 25, and not vary from December 25 to 31. New Year's, or the Circumcision, would similarly be preceded by a holiday (Year-End Day) and would always be on January 1, first day of the year, Sunday, instead of varying from January 1 to 7.

Easter, besides always coming on the fifteenth Sunday of the year, would always be April 8, instead of changing from April 8 to 14. The same would be true of all feasts and Sundays dependent on Easter; besides being definite Sundays or weekdays of the year, they would always come on the same dates. The question then arises: why introduce all the novelties Herr Achatz suggests (and most prominent of these would be the varying dates of Christmas, the Circumcision and the Epiphany), and still not have fixity? Why not as well be hanged for a sheep as for a lamb? Any extensive disturbance of the calendar such as Herr Achatz suggests is sure to meet with determined opposition. Why not challenge the opposition once and for all on every front? If the plan proposed by our author were put into effect, after a necessarily long struggle, there would still exist the further need of a calendar with fixed *dates* as well as fixed *days:* and the whole battle would have to be fought all over again.

If it is desirable to narrow down the movability of Easter from 35 to seven days, it is still more desirable to eliminate that movability altogether. If it is desirable to have Christmas and New Year's on the same day each year, it is still more desirable to have them on the same day and the same date. But these things cannot be done without the "supplementary day" idea. Therefore, those favoring regularity and stability in the calendar must above everything study, and discuss, and thrash out, and eventually, let one hope, advocate the supplementary day. And once they advocate it, they will advocate The World Calendar, for this is the only plan proposing the extra day that is receiving widespread and constant support all over the world. The supplementary day is the real core of the question. To eliminate it, to obscure it, to disregard it, is merely to put off the time when we shall have in the calendar a regularity that is really regular and a fixity that is really fixed.

CURRENT PRESS COMMENT

Leap Year

Philadelphia Inquirer

The year 1940 may conceivably be the last Leap Year we ever shall have in the style to which we are accustomed. There is a strong international move on foot to alter our calendar and to change the structure of leap years. There is wide recognition of the need for a new calendar and most of the nations of the world are in favor of having a new one.

Business and commerce today are seriously inconvenienced by the vagaries of our calendar and the bulk of support for the movement to alter it comes from business men and institutions. Labor organizations also are in favor of change.

A Fixed Easter

London Observer

This year was one of the few occasions on which an extremely early Easter was not a source of irritation. The victims of strain and war pressure are glad of a "break" under any sort of conditions. Neither religion nor history confers any sanctity on the system by which the festival takes its place in the calendar. The arrangement rests on an elaborate convention ingeniously devised by a medieval Pope to reconcile the dependence of the Jewish Passover on the full moon with the fact that such fullness varies from one degree of longitude to another. The "Ecclesiastical Full Moon" of our English Prayer Book is an orb that never was on land or sea. Its invention was a concession to mundane convenience which we are quite entitled to imitate and mend.

A fixed Easter would mean a most useful simplification of the calendar in the interests of practical life. The worlds of business, law, and education would all be relieved of an irritating irregularity.

Calendar and Life

Buffalo (N. Y.) Courier-Express

We are living in an epochal period in history, an era of great portent, a period of transition which doubtless will go down in the records as one of the most revolutionary. There have been major calendar changes in the past. The books are not closed. The World Calendar plan or some other on the same or improved order, despite the derisive comments of the conservatives, may yet regulate the coming and going, the sleeping and waking, the work and business and the holidays of our children and children's children until the distant day when another calendar reform may make even The World Calendar plan seem ancient and cumbersome.

Return to Simplicity

Ann Arbor (Mich.) News

Everything from the conduct of business to the pursuit of pleasure would be easier under a calendar like The World Calendar. In a world which sometimes bewilders because of its increasing complexity, the proposed World Calendar is a gratifying return to simplicity. It might be impossible for all the nations of the world to agree at the outset on even a reform so uncontroversial as a calendar. But if the United States should show the way, other countries would soon follow.

Our Haywire Holidays

Goshen (N. Y.) Democrat

The World Calendar, although it would still leave something to be desired in regard to holiday revision, would be a vast improvement over our present calendar system. It would make for several holiday improvements, and we would at least know the holidays would occur the same days each year and could plan for them accordingly. With such a calendar in operation, we could then proceed to revise our holiday set-up without undue difficulty.

A wholesale revision of our major holidays, wherein we could derive from them the best benefits of leisure, would be a godsend to everyone. It's nothing short of "wacky" to continue celebrating holidays which break into the normal scheme of life without any authoritative reason.

EXCERPTS AND REVIEWS

Timepiece

ETHEL KING

In *The New York Times*, March, 1940

All the plans to reckon time
Are somewhere stamped with the sublime.
There is wonder in the ways
Men devise to count life's days—
Hour-glass, sun-dial, the clock's tick tack,
Calendar and almanack.
Stars and heavens, seasons, tides,
These are the computer's guides.
Nothing strange that high design
Traffics with this coinage fine,
For time is the admission fee
To the super-show, eternity.

Time of Adoption

ELISABETH ACHELIS

Address in connection with the opening of the September, 1940, lecture at the Hayden Planetarium entitled "Sky Clocks and Calendars."

WE have just heard a most interesting talk on "Sky Clocks and Calendars," and have seen, or will see before we leave, the exhibition of pictures which are on view on the first floor, depicting the early history of the calendar and the proposed new World Calendar of 12 months and equal quarters.

The important fact which directly concerns us, is when can this calendar be placed in operation. Obviously the transition should be easy when a day, date and month of the present calendar coincide with the same day, date and month of the new one. This coincidental day occurs Saturday, December 30, 1944. The following day and date in the old calendar, Sunday, December 31, 1944, would then become the new World-Holiday, that extra or double Saturday, the new "Year-End Day" —and The World Calendar would begin on Sunday, January 1, 1945.

The Eastern Hemisphere today is unhappily in the throes of war, so that the Western Hemisphere would be the logical place and the United States the country to take the lead in calling the international conference for the purpose of putting The World Calendar into operation.

Many government departments already favor it, among them being the United States Naval Observatory and the Division of Weights and Measures of the United States Department of Commerce. And were the State Department and the President properly impressed with its importance and significance they would call an international conference to meet in Washington, in 1942 or not later than 1943. Such a conference is certain to be effective in bringing nations closer together through the common-bond-of-time and would be a great influence toward establishing greater world cooperation.

Future history may well record that the *year* of the international conference and the *year* when The World Calendar was put into practical use were highly significant ones for civilization. Our generation is given an unusual opportunity to contribute toward a new era of good will through the adoption of the perpetual World Calendar of 12 months and equal quarters.

I Am The Calendar

An interesting item discovered by Charles Schaer of San Juan, Puerto Rico.

I have two missions: one of utility, one of sentiment.

I am the symbol of time, combining the past, the present and the future.

All the world looks at me, talks about me, and regulates its business and social life by me.

No letter is ever written, no book ever published, no money ever coined, that does not bear my imprint. I am the one thing that the world must constantly consult.

I ask for display space in your place of business or your home. In return I guarantee to be useful, and I hope to be decorative.

I admit that in that space I will constantly work for Rolph-Clark-Stone, Limited, telling you and your friends who they are, where they are and what they have to sell.

I am one of their salesmen, anxious to impress you favorably and to remind you tactfully on each day of the year that my employers value your business.

But I am more—I am their ambassador of good will. I carry their best wishes for your health, happiness and prosperity to you, their friend.

The Struggle Against Routine

By Senor J. O. Mariotti

In *La Vanguardia,* Buenos Aires, Argentina, February, 1940

THE practical consequences of every kind which the adoption of the perpetual World Calendar would bring about are easy to imagine. Order would soon be achieved in the occurrence of the holidays, and there would be an end to "on what day will Lent, or Christmas, or Epiphany fall? etc."—with its resultant advantages.

If we consider the evident advantages which this calendar presents with respect to world-wide uniformity in the systems of chronological notation, it would seem strange that its application has not yet been initiated. This is so as a result of the accumulation of traditions and customs which have become rooted in the spirit of the peoples, forming habits difficult to eliminate. Tradition and habit exert a great influence on many things; but as everything is changing, it is to be hoped that in this case, as in others, they will yield to the renovating impulse of science, so that the perpetual calendar may soon be adopted universally to note the illusory intervals of the time that is passing.

This Changing World

By Frank Parker Stockbridge

THERE aren't, of course, any reasons except sentimental ones for celebrating any holiday on any particular date. That isn't to say that sentimental reasons are not often as good as or better than logical reasons. Tradition, habit and custom count for so much in human affairs that efforts to change them meet with resistance, sometimes too powerful to be overcome.

Thus a great number of people felt outraged when President Roosevelt proclaimed last year November 23 as Thanksgiving Day instead of the traditional last Thursday in November, and half or more of the state governors followed public sentiment and proclaimed the 30th as the day of thanks. Of course, since each state is a law unto itself, and neither Thanksgiving Day nor any other day is in strict sense a national holiday, since Congress has never enacted a statute, and probably can't, compelling the observance of any day as a holiday everywhere, each state can do as it pleases about Thanksgiving, and so can the President; the only legal force of a Presidential holiday proclamation is to make it compulsory in the District of Columbia, the Territories and Island possessions of the United States.

There isn't any but a sentimental reason, therefore, why Thanksgiving shouldn't be observed on the fourth Monday in November, instead of the last Thursday*; and that is one of the ideas put forward by Miss Elisabeth Achelis, founder of The World Calendar Association. Such a change would give us another three-day week-end, at any rate—and why not?

Under The World Calendar plan, the the fourth Monday in November would always fall on the 27th, just as each day of the week in any given month would always fall on the same date. To folk who put sentiment and tradition above reason and logic there is something almost sacrilegious in tinkering with the calendar. But it's been done not once but many times.

There isn't any reason why it shouldn't be changed again. There probably would be a great revolt against changing Christmas Day to any date but December 25, which would always fall on Monday under the calendar reform plan. There is actually no historical record to prove that Jesus was born on that particular day or any other definite date. The early Church paid little attention to Christmas. Three or four hundred years after the Crucifixion some of the churches began to celebrate the birth of Our Lord, on different dates. It was not until the Sixth Century that the date of December 25 was agreed upon as appropriate and adopted by the Church.

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*Editor's Note: The World Calendar Association favors the fourth Thursday in November for Thanksgiving. After the adoption of the permanent World Calendar the change to a fourth Monday could be easily made should people desire it.

FROM THE MAIL BAG

I am glad, indeed, to have my name associated with something in which I believe so much.—Wm. Adams Brown, D.D., Union Theological Seminary, N. Y.

The information furnished by your Association will be shared with students and faculty at Springfield College.—Dr. Albert Z. Mann, Springfield College, Mass.

There is a great deal to be said for the changes which your Association is sponsoring. I am sure that the universal adoption of a fixed and exact year would be well worth while.—Mark Woods, Treas., Nat'l Broadcasting Co., N. Y. C.

I am constantly impressed with the enormous and unnecessary complexity of all of our work, with monthly indexes and seasonal cycles, which is unnecessarily imposed upon us by the present disorderly calendar.—Walter Mitchell, Jr., Dun and Bradstreet, N. Y. C.

Personally I heartily and enthusiastically endorse The World Calendar and I am sure its adoption would be welcomed by all colleges and universities which each year have so much trouble making schedules with the existing system.—Dr. C. E. ZoBell, Assistant Director, The Scripps Institution of Oceanography, Univ. of Cal.

It is a most regrettable thing that we should have been so slow to appreciate the great value—both in a general practical way, and even socially—of the proposed World Calendar; considering that it can be so readily adapted to every need of all sections of people of all nationalities throughout the world.—D. G. Stead, Watson's Bay, N. S. W., Australia.

We have decided to drop the 13-month calendar, being convinced now that your plan is far and away the best.—Fr. Gordon Krahe, Editor, *Franciscan Almanac*, Washington, D. C.

The proposed World Calendar has many advantages over our present calendar and deserves world interest and recognition.—The Rev. G. K. Andeen, Providence, R. I.

I agree that "the adoption of a World Calendar might well have a definite influence in the bettering of international relations."—Dr. R. Whitaker, Los Gatos, Cal.

There are practical advantages in and no considerable objection to the proposed calendar change.—The Rev. W. A. Aiken, Auburn, N. Y.

Calendar reform seems inevitable. For efficiency and convenience there should be some change.—Charles B. Paine, Atty., Lincoln, Neb.

"Contenders for Time's Honors," by Professor F. W. Adams is in many ways one of the most informing contributions ever made to your valuable magazine on the history of calendar changes.—The Rev. G. F. Hubbartt, Columbia City, Ind.

The World Calendar is useful and worth while.—R. M. MacIver, Columbia Univ.

It is evident there is an increasing momentum to The World Calendar.—C. Reynolds, Editor, *Office Equipment*, Chicago.

Hope general approval and action may come soon.—The Rev. F. W. Backemeyer, Gary, Ind.

I see great values in the new calendar and wish you the best of fortune in bringing about its final consummation.—The Rev. E. W. Foster, Racine, Wis.

I shall continue as I have in the past to be a booster for this change, which is so greatly needed by the business world and is so long in being fulfilled.—R. C. Perkins, Adohr Milk Farms, Los Angeles.

The calendar should be made for man, not man for the calendar—The Rev. C. F. Unger, Readington, N. J.

Your movement is fighting for the acme of consistency and more power to you.—C. N. Ottosen, Atty., Salt Lake City.

There is no possible dogmatic objection against calendar reform and there is the most weighty precedent in the Gregorian calendar. I wish you success.—Prof. W. Lutoslawski, Krakow, Poland.

I believe The World Calendar to be the correct reform and one that ought to come soon.—K. K. Tibbetts, Supt. of Public Schools, Wheaton, Ill.

I am in sympathy with the objectives of your Association.—Dr. E. G. Mears, Dir. of Summer Quarter, Stanford Univ.

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Membership is based on active interest in the study of adequate and effective improvement of the calendar. Owing to lack of space, a large number of names have been omitted. They will be printed in future issues.

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Journal of
CALENDAR REFORM

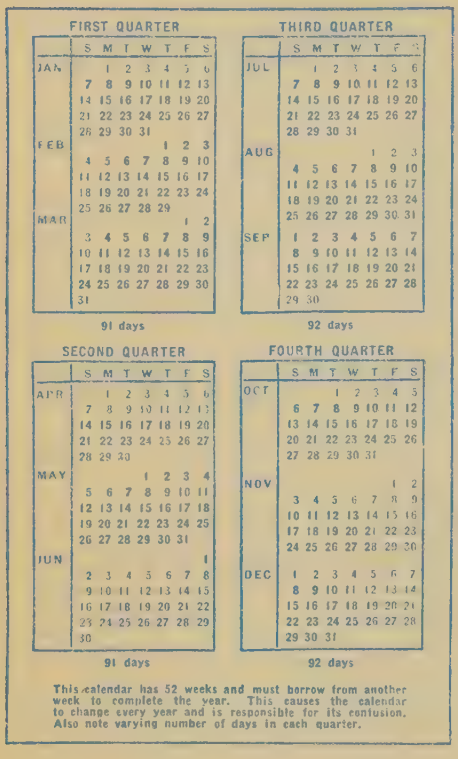
FIRST QUARTER

1940

1940

A LEAP YEAR

PRESENT GREGORIAN CALENDAR



FIRST QUARTER

	S	M	T	W	T	F	S
JAN		1	2	3	4	5	6
	7	8	9	10	11	12	13
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FEB					1	2	3
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MAR						1	2
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	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
	31						

91 days

THIRD QUARTER

	S	M	T	W	T	F	S
JUL		1	2	3	4	5	6
	7	8	9	10	11	12	13
	14	15	16	17	18	19	20
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	28	29	30	31			
AUG					1	2	3
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	22	23	24	25	26	27	28
	29	30					

92 days

SECOND QUARTER

	S	M	T	W	T	F	S
APR							
	7	8	9	10	11	12	13
	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
	28	29	30				
MAY				1	2	3	4
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	19	20	21	22	23	24	25
	26	27	28	29	30	31	
JUN							1
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	16	17	18	19	20	21	22
	23	24	25	26	27	28	29
	30						

91 days

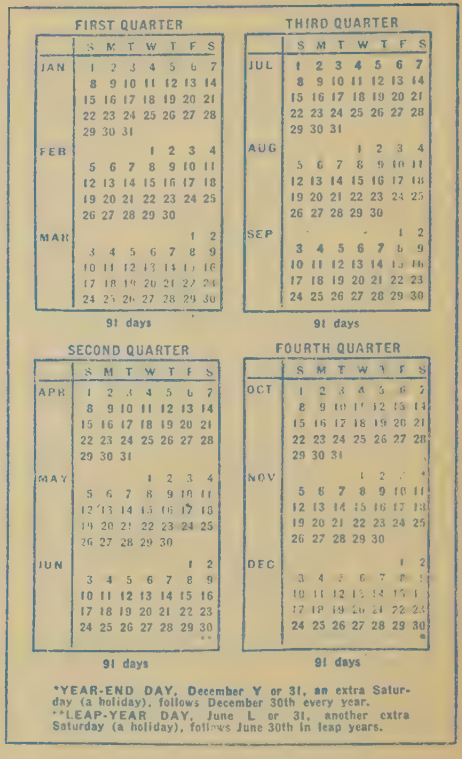
FOURTH QUARTER

	S	M	T	W	T	F	S
OCT							
	6	7	8	9	10	11	12
	13	14	15	16	17	18	19
	20	21	22	23	24	25	26
	27	28	29	30	31		
NOV						1	2
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
DEC	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31				

92 days

This calendar has 52 weeks and must borrow from another week to complete the year. This causes the calendar to change every year and is responsible for its confusion. Also note varying number of days in each quarter.

PROPOSED WORLD CALENDAR



FIRST QUARTER

	S	M	T	W	T	F	S
JAN	1	2	3	4	5	6	7
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FEB				1	2	3	4
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	26	27	28	29	30		
MAR						1	2
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	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30

91 days

THIRD QUARTER

	S	M	T	W	T	F	S
JUL	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
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	29	30	31				
AUG				1	2	3	4
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	19	20	21	22	23	24	25
	26	27	28	29	30		
SEP						1	2
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	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30

91 days

SECOND QUARTER

	S	M	T	W	T	F	S
APR	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31				
MAY				1	2	3	4
	5	6	7	8	9	10	11
	12	13	14	15	16	17	18
	19	20	21	22	23	24	25
	26	27	28	29	30		
JUN						1	2
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
	**						

91 days

FOURTH QUARTER

	S	M	T	W	T	F	S
OCT	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31				
NOV				1	2	3	4
	5	6	7	8	9	10	11
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	26	27	28	29	30		
DEC						1	2
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
	*						

91 days

*YEAR-END DAY, December Y or 31, an extra Saturday (a holiday), follows December 30th every year.
**LEAP-YEAR DAY, June L or 31, another extra Saturday (a holiday), follows June 30th in leap years.

EACH YEAR DIFFERENT

This calendar is always different from year to year.

The quarters are unequal in length. In leap years the first half-year has 182 days; the second, 184 days.

Each quarter begins and ends on a different day of the week.

Each month begins and ends on a different weekday.

The months have a varying number of weekdays.

Each year begins on a different weekday.

This calendar is unbalanced in structure, unstable in form, and irregular in arrangement.

SOON YOU WILL BE DISCARDING THIS OBSOLETE CALENDAR.

EACH YEAR THE SAME

This 12-month equal-quarter calendar is good for every year.

The quarters are equal in length.

Each quarter begins on Sunday and ends on Saturday, contains 3 months—13 weeks—91 days.

Month-dates always fall on the same weekdays. Each month has 26 *weekdays*—plus Sundays.

Each year begins on Sunday.

Year-End Day and Leap-Year Day, the extra Saturdays, are world-holidays.

This revised calendar is balanced in structure, perpetual in form, harmonious in arrangement.

SOON YOU WILL BE USING THIS UP-TO-DATE CALENDAR.

EDITORIAL PARAGRAPHS

Those devoted to improvement of the calendar have long been agitating for a Thanksgiving Day reform which will not only move the holiday up to where Roosevelt has placed it but also put it on a Monday instead of a Thursday.—Erie (Pa.) *Dispatch-Herald.*

There are plenty of good reasons why the present time-system should be superseded by a more practical one.—Lansing (Mich.) *State Journal.*

Fixing the Thanksgiving Day holiday on a Monday instead of a Thursday is an interesting and original suggestion. If change there has to be, Monday would be ever so much preferable to Thursday.—Bristol (Conn.) *Press.*

This World Calendar plan has distinct advantages from a business point of view, in addition to the fact that national holidays would have always a definite time and date conveniently located at the week-end for maximum enjoyment.—Dunnville (Canada) *Gazette.*

There was in the beginning no especial reason why Thursday was chosen as the date for Thanksgiving.—Huntington (W. Va.) *Herald-Dispatch.*

Clergymen, editors, teachers, business men and lawyers have studied The World Calendar plan and given it hearty approval. —Weston (Mass.) *News.*

The calendar is a human institution and still has its defects, although it has been redesigned half a dozen times.—Jackson (Mich.) *Citizen-Patriot.*

For our part we hope The World Calendar Association does make a success of it, if only because of the irrepressible spirit with which they seek their objective.—Cedar Rapids (Iowa) *Gazette.*

Before Lincoln's time there were Thanksgiving days, but they fell on varying days of the week, more often Monday than Thursday.—Durant (Okla.) *Daily Democrat.*

Probably at some future date, we shall find a uniform, common-sense calendar in effect.—Granby (Canada) *Leader-Mail.*

All the hubbub attendant on the decision of the President to change Thanksgiving Day from the last Thursday in November to the fourth Thursday would have been avoided under the system of time contemplated by The World Calendar Association. Some strong nation should take the initiative and start to put the idea over. Why not the United States?—Marinette (Wis.) *Eagle-Star.*

So far as a layman may see, the calendar reformers have logic aplenty behind their arguments, and we hope the new calendar will be adopted.—Bradford (Pa.) *Herald.*

Understanding of what has happened to the calendar in the past should make it easy to reform it once more in accordance with one or another of the scientific proposals.—Plainfield (N. J.) *Courier-News.*

For many years we have been interested in seeing a change in the calendar, making it more practical and comprehensive.—Fulton (Mo.) *Sun-Gazette.*

Shortcomings of the calendar are so obvious and familiar that we overlook them. —Columbus (Ohio) *Dispatch.*

There would be many benefits if The World Calendar Association, Inc., could succeed in their aim to have the calendar so changed that each quarter would be 91 days long, would begin on Sunday and end on Saturday.—Liberty (Mo.) *Advance.*

If the calendar is revised according to the plan proposed by The World Calendar Association, Washington's birthday probably would be celebrated once more on February 11.—Joplin (Mo.) *Globe.*

The World Calendar Association is working earnestly to bring about calendar reforms that will systematize and make uniform each successive year. — Waterbury (Conn.) *Democrat.*

The world has changed in most of its aspects, so it seems to be about the time in which we should change the calendar also. —Belleville (Ill.) *News-Democrat.*

This year was the chance of a lifetime for some great leader to convince our old world of advantages of the new World Calendar, a scientific, logical and practical change from that method of reckoning time in uneven chunks which has afflicted the world since the period of Julius Caesar and Pope Gregory.—Gunnison (Col.) *News.*

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V I S I T

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NOW AT THE

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MUSEUM OF SCIENCE AND INDUSTRY

R. C. A. BLDG. ROCKEFELLER CENTER
NEW YORK CITY

Journal of CALENDAR REFORM

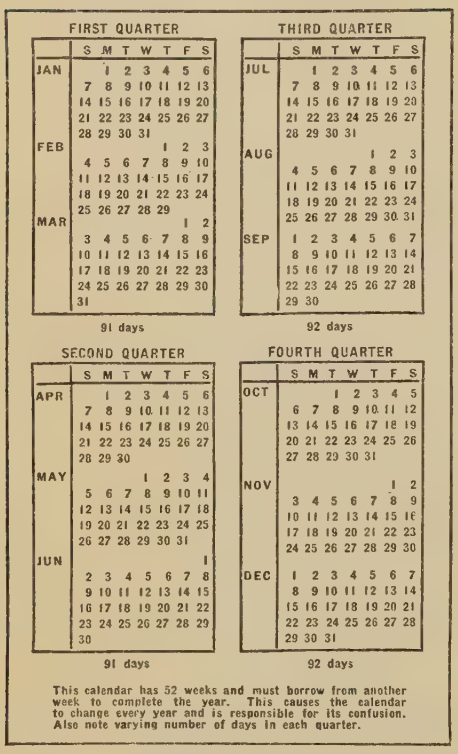
SECOND QUARTER

1940

1940

A LEAP YEAR

PRESENT GREGORIAN CALENDAR



FIRST QUARTER

	S	M	T	W	T	F	S
JAN		1	2	3	4	5	6
	7	8	9	10	11	12	13
	14	15	16	17	18	19	20
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FEB					1	2	3
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MAR						1	2
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	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
	31						

91 days

THIRD QUARTER

	S	M	T	W	T	F	S
JUL		1	2	3	4	5	6
	7	8	9	10	11	12	13
	14	15	16	17	18	19	20
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	28	29	30	31			
AUG					1	2	3
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SEP	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
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	22	23	24	25	26	27	28
	29	30					

92 days

SECOND QUARTER

	S	M	T	W	T	F	S
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JUN						1	2
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	24	25	26	27	28	29	30

91 days

FOURTH QUARTER

	S	M	T	W	T	F	S
OCT					1	2	3
	4	5	6	7	8	9	10
	11	12	13	14	15	16	17
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NOV							
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DEC			1	2	3	4	5
	6	7	8	9	10	11	12
	13	14	15	16	17	18	19
	20	21	22	23	24	25	26
	27	28	29	30	31		

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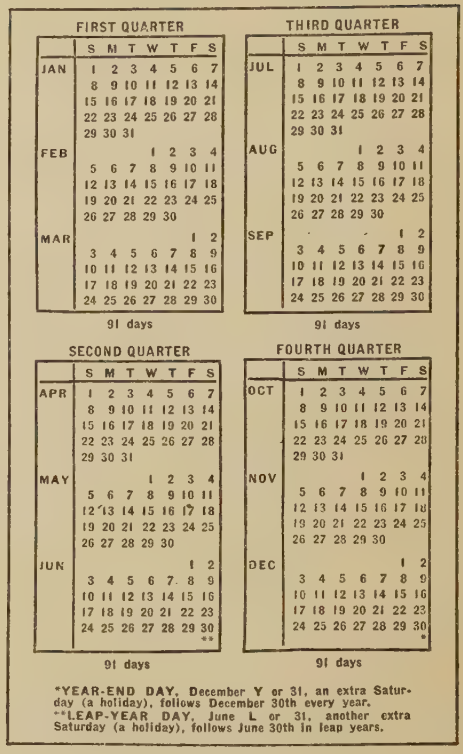

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	S	M	T	W	T	F	S
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	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31				
FEB				1	2	3	4
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MAR						1	2
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	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30

91 days

THIRD QUARTER

	S	M	T	W	T	F	S
JUL	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
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	29	30	31				
AUG				1	2	3	4
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	26	27	28	29	30		
SEP						1	2
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	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30

91 days

SECOND QUARTER

	S	M	T	W	T	F	S
APR	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
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	29	30	31				
MAY				1	2	3	4
	5	6	7	8	9	10	11
	12	13	14	15	16	17	18
	19	20	21	22	23	24	25
	26	27	28	29	30		
JUN						1	2
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
							**

91 days

FOURTH QUARTER

	S	M	T	W	T	F	S
OCT	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31				
NOV				1	2	3	4
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	26	27	28	29	30		
DEC						1	2
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	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
							*

91 days

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EACH YEAR DIFFERENT

This calendar is always different from year to year.

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Each quarter begins and ends on a different day of the week.

Each month begins and ends on a different weekday.

The months have a varying number of weekdays.

Each year begins on a different weekday.

This calendar is unbalanced in structure, unstable in form, and irregular in arrangement.

SOON YOU WILL BE DISCARDING THIS OBSOLETE CALENDAR.

EACH YEAR THE SAME

This 12-month equal-quarter calendar is good for every year.

The quarters are equal in length.

Each quarter begins on Sunday and ends on Saturday, contains 3 months—13 weeks—91 days.

Month-dates always fall on the same weekdays. Each month has 26 *weekdays*—plus Sundays.

Each year begins on Sunday.

Year-End Day and Leap-Year Day, the extra Saturdays, are world-holidays.

This revised calendar is balanced in structure, perpetual in form, harmonious in arrangement.

SOON YOU WILL BE USING THIS UP-TO-DATE CALENDAR.

EDITORIAL PARAGRAPHS

Days, weeks and months play such an important part in our lives that it is difficult to realize what life was like in the past, when people had to get along without anything in the form of a calendar.—San Francisco (Cal.) *Commercial News.*

Most people seem willing to comply with the President's request for an earlier observance of Thanksgiving Day. They wish he'd gone further—they want him to advance the date to Monday. Then everybody would have a two-day holiday.—Faribault (Minn.) *News.*

Fourteen nations have stated officially that they are ready to adopt the new calendar.—Liberty (Mo.) *Advance.*

The partisans of the 12-month plan simply wish to adapt, in a wise and discreet reform, our secular and millenary calendar to the exigencies of modern life.—Paris (France) *La Croix de Paris.*

The *Journal of Calendar Reform* is now in its tenth volume. This admirable magazine is of practical interest to all who are concerned with the improvement of the present cumbersome and antiquated calendar.—San Francisco (Cal.) *Sierra Educational News.*

The World Calendar makes sense which is why sensible persons are convinced that it should be put into world use.—Berkeley (Cal.) *Courier.*

The leading commercial countries could adopt The World Calendar by simple legislation, the rest would be forced to follow suit.—Lead (S. D.) *Call.*

Everybody who has given thought to the question of changing the present calendar knows the inconveniences of the one now in use.—Clifton Forge (Va.) *Review.*

That the interest in the reform of the calendar is becoming widespread is indicated by an article written by the Reverend Swami Omkar, a Christian of India and head of an Indian ashram.—Utica, (N. Y.) *Federal Council Bulletin.*

We have always thought that time went on forever, without change. Perhaps it does, but the general interest in The World Calendar plan proves that the method of measuring time is subject to change.—Odebalt (Ia.) *Chronicle.*

The first Thanksgiving Day proclamation, issued by William Bradford, Governor of Plymouth in 1621, Named Friday, November 19.—New Brunswick (N. J.) *News.*

Monday holidays are only one of several suggested changes in the calendar, all intended for the purpose of greater uniformity and efficiency not only in business but in all the other matters in which the calendar is an important part.—Owosso (Mich.) *Argus-Press.*

One result of the pacification of Europe —if and when it comes—will be the universal adoption of a fixed date for Easter, instead of a "movable feast." — London (England) *Leader.*

The beauty of The World Calendar is that it provides fixed dates for holidays and other observed events. — Waterbury (Conn.) *Democrat.*

The proposed perpetual calendar has much to recommend it. It has been approved by 14 governments. — Lansing (Mich.) *State Journal.*

Business men, workers, professional people, and everyone in all walks of life should be interested in the proposal for revision and modernization of the calendar.—Lovell (Wyo.) *Chronicle.*

The World Calendar harmonizes with the solar year and its four seasons, by adding an extra Saturday at the end of every year and an extra Saturday in leap years. It all makes sense which is why sensible persons are convinced that it should be put into world use.—Harrodsburg (Ky.) *Herald.*

Christmas was given a fixed date in the solar calendar long ago by Church action, so the fixing of the second great feast of the Church would not be without precedent.—Council Bluffs (Ia.) *Nonpareil.*

Correspondents in the English Press have for some time past been advocating a calendar reform with a fixed Easter.—Carnarvon (Wales) *Herald.*

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Journal of CALENDAR REFORM

THIRD QUARTER

1940

1940

A LEAP YEAR

PRESENT GREGORIAN CALENDAR

FIRST QUARTER

	S	M	T	W	T	F	S
JAN			1	2	3	4	5	6
	7	8	9	10	11	12	13
	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
	28	29	30	31			
FEB					1	2	3
	4	5	6	7	8	9	10
	11	12	13	14	15	16	17
	18	19	20	21	22	23	24
	25	26	27	28	29		
MAR						1	2
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
	31						

91 days

THIRD QUARTER

	S	M	T	W	T	F	S
JUL				1	2	3	4	5	6
	7	8	9	10	11	12	13
	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
	28	29	30	31			
AUG					1	2	3
	4	5	6	7	8	9	10
	11	12	13	14	15	16	17
	18	19	20	21	22	23	24
	25	26	27	28	29	30	31
SEP	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30					

92 days

SECOND QUARTER

	S	M	T	W	T	F	S
APR							
	7	8	9	10	11	12	13
	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
	28	29	30				
MAY				1	2	3	4
	5	6	7	8	9	10	11
	12	13	14	15	16	17	18
	19	20	21	22	23	24	25
	26	27	28	29	30	31	
JUN							1
	2	3	4	5	6	7	8
	9	10	11	12	13	14	15
	16	17	18	19	20	21	22
	23	24	25	26	27	28	29
	30						

91 days

FOURTH QUARTER

	S	M	T	W	T	F	S
OCT				1	2	3	4	5	6
	7	8	9	10	11	12	13
	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
	28	29	30	31			
NOV						1	2
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
DEC	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31				

92 days

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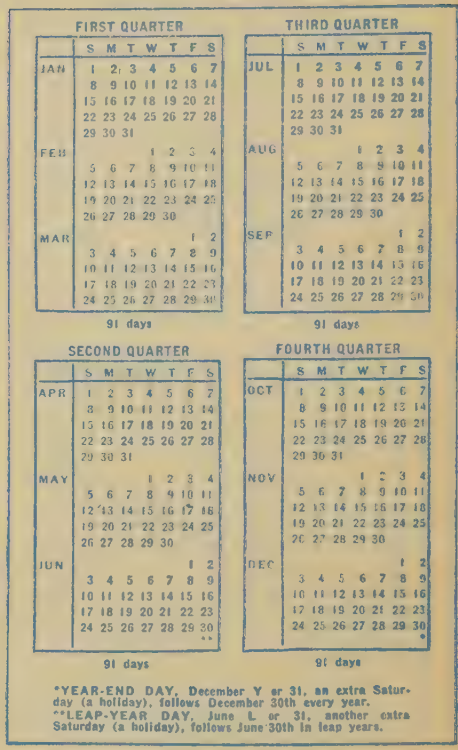

FIRST QUARTER

	S	M	T	W	T	F	S
JAN	1	2	3	4	5	6	7
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	15	16	17	18	19	20	21
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FEB				1	2	3	4
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91 days

THIRD QUARTER

	S	M	T	W	T	F	S
JUL	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
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	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30

91 days

SECOND QUARTER

	S	M	T	W	T	F	S
APR	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
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	29	30	31				
MAY				1	2	3	4
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	19	20	21	22	23	24	25
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JUN						1	2
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	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
							**

91 days

FOURTH QUARTER

	S	M	T	W	T	F	S
OCT	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31				
NOV				1	2	3	4
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DEC						1	2
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EDITORIAL PARAGRAPHS

The present calendar is by no means perfect. The hard fact is that the year isn't what we say it is, and like the circle, it simply can't be squared.—*New York Times.*

We need hardly add that the Church would have no objection to a fixed Easter if international agreement could be obtained.—London (England) *Catholic Herald.*

Enlisting in the effort to get a more practical form of calendar, the Chicago Woman's Club has a World Calendar Committee.—Boston (Mass.) *Christian Science Monitor.*

The reform of our calendar has long been under discussion. The World Calendar is sponsored by scientific, business, religious and educational organizations all over the world, including the United States.—San Francisco (Cal.) *Commercial News.*

Women's support should give calendar reform great impetus.—Brooklyn (N. Y.) *Citizen.*

The advocates of the Fixed Easter in April have made great progress—Glasgow (Scotland) *Glasgow Weekly News.*

The U. S. Government has recognized The World Calendar Association as an "educational" organization. — Portsmouth (England) *Portsmouth Evening News.*

There are signs that before very long all of us may be on a new calendar basis. If so, it will mark the second change in what might be termed the modern history of the world.—Bismarck (N. D.) *Tribune.*

That the calendar needs revising must be obvious to anybody who reads the papers. The calendar has not kept abreast of the times.—Tampa (Fla.) *Times.*

The clumsiness of the calendar under which the world operates is a constant source of irritation. — Allentown (Pa.) *Call.*

All this confusion is but one more argument in favor of a simplified calendar, if we can ever get around to it.—Macon (Ga.) *Telegraph.*

The calendar has been changed in the past, and from this distance it would seem that the changes were in the nature of improvements.—Natchez (Miss.) *Democrat.*

Old Father Time declared an extra dividend February 29—the quadrennial Leap-Year Day.—Woonsocket (R. I.) *Call.*

Reasons continue to multiply for the reformation of our calendar.—Port Huron (Mich.) *Times-Herald.*

To join the observance of the birthdays of Washington and Lincoln on one and the same week-end is one of the aims of The World Calendar Association.—Burlington (Vt.) *Free Press.*

It is contended that a more nearly uniform calendar, with the same day of the week always occurring on the same day of the month, would simplify bookkeeping, pay-rolls and the arrangement of days off. —Manchester (N. H.) *Daily.*

The World Calendar plan, if universally adopted, might create some confusion for a time, but it has advantages that are quite obvious, for it would eliminate the difficulties caused by our present uneven calendar.—Warren (Ohio) *Tribune-Chronicle.*

Various holidays observed by all or part of the nation in the past few months have served as the basis for new discussions on the desirability of revising the calendar.—Norman (Okla.) *Transcript.*

It is a certainty that business men, lawyers and housewives will some day force this reform in our calendar, since the ecclesiastics have raised no objection.—Tiverton (R. I.) *Newport Co. Sentinel.*

Looking forward to an age of more leisure for the working class, means that holidays at regular dates instead of fluctuating, would aid the planning of vacations. —Lovell (Wyo.) *Chronicle.*

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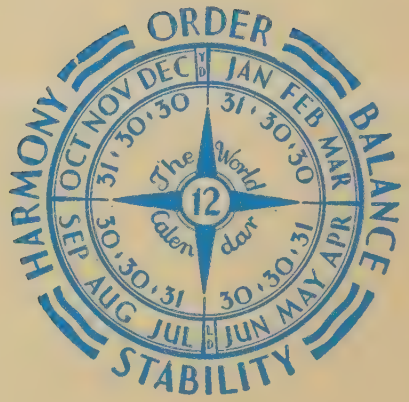

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FIRST QUARTER

	S	M	T	W	T	F	S
JAN		1	2	3	4	5	6
	7	8	9	10	11	12	13
	14	15	16	17	18	19	20
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	31						

91 days

THIRD QUARTER

	S	M	T	W	T	F	S
JUL		1	2	3	4	5	6
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	14	15	16	17	18	19	20
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	28	29	30	31			
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	22	23	24	25	26	27	28
	29	30					

92 days

SECOND QUARTER

	S	M	T	W	T	F	S
APR							
	7	8	9	10	11	12	13
	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
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JUN							1
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	30						

91 days

FOURTH QUARTER

	S	M	T	W	T	F	S
OCT			1	2	3	4	5
	6	7	8	9	10	11	12
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	27	28	29	30	31		
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92 days

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FIRST QUARTER

	S	M	T	W	T	F	S
JAN	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31				
FEB				1	2	3	4
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91 days

THIRD QUARTER

	S	M	T	W	T	F	S
JUL	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
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	29	30	31				
AUG				1	2	3	4
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	19	20	21	22	23	24	25
	26	27	28	29	30		
SEP						1	2
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	17	18	19	20	21	22	23
	24	25	26	27	28	29	30

91 days

SECOND QUARTER

	S	M	T	W	T	F	S
APR	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31				
MAY				1	2	3	4
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JUN						1	2
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	24	25	26	27	28	29	30
							**

91 days

FOURTH QUARTER

	S	M	T	W	T	F	S
OCT	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31				
NOV				1	2	3	4
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This calendar is unbalanced in structure, unstable in form, and irregular in arrangement.

SOON YOU WILL BE DISCARDING THIS OBSOLETE CALENDAR.

EACH YEAR THE SAME

This 12-month equal-quarter calendar is good for every year.

The quarters are equal in length.

Each quarter begins on Sunday and ends on Saturday, contains 3 months — 13 weeks—91 days.

Month-dates always fall on the same weekdays. Each month has 26 *weekdays*—plus Sundays.

Each year begins on Sunday.

Year-End Day and Leap-Year Day, the extra Saturdays, are World-Holidays.

This revised calendar is balanced in structure, perpetual in form, harmonious in arrangement.

SOON YOU WILL BE USING THIS UP-TO-DATE CALENDAR.

EDITORIAL PARAGRAPHS

There is continual agitation for a better and more logical calendar. Some day it may get somewhere.—New York *News.*

A fixed Easter would mean a most useful simplification of the calendar in the interests of practical life.—London (England) *Observer.*

The World Calendar is in keeping with the solar year and the seasons. Shifting holidays are stabilized.—San Francisco (Cal.) *Commercial News.*

Calendar reformers hope that this year will be the last in which February will have to bear the burden of four years' accumulated "overtime."—Boston (Mass.) *Christian Science Monitor.*

Calendar reformers claim that their new system of dividing the year would make printed calendars almost unnecessary.—Philadelphia (Pa.) *Evening Public Ledger.*

Only once in the memory of anybody under 84 has Easter fallen earlier than it was this year.—London (England) *Everybody's Weekly.*

Growing sentiment for calendar reform is reported from agricultural states.—Fort Worth (Tex.) *Morning Star-Telegram.*

Reform of the calendar has exercised the minds of religious bodies, astronomers, mathematicians, scientists, governments, business men for centuries.—Melbourne (Australia) *The Age.*

Those who never seem to get around to doing many of the things that need to be done should be grateful for the extra day which the calendar and Father Time have provided in allowing this February 29 instead of the usual 28 days.—Roanoke (Va.) *Times.*

Selling The World Calendar idea to the whole civilized world looks like a pretty big job, we'll admit, but its sponsors feel that the thing can be done in time to put the calendar into effect in 1945.—Fairmont (W. Va.) *Times.*

The curious wanderings of Easter are set forth in the Book of Common Prayer, which lists the dates of Easter for a period from 1786 to 2013.—Hopkinsville (Ky.) *New Era.*

The World Calendar plan is being studied seriously throughout the world.—Royal Oak (Mich.) *Daily Tribune.*

The wanderings of Easter bring yearly confusion to the Church calendar as well as to the textile trade,to the horticulturist, to the travel business, to hotel accommodations and transportation schedules, as well as to education and vacation plans.—Hagerstown (Md.) *Herald.*

The World Calendar would facilitate statistical comparison and would stabilize holidays. The transition from the Gregorian to the new calendar could be made without any complications whatever.—Prague (Czechoslovakia) *Vesmir.*

It is contended that a more uniform calendar, with the same day of the week always occurring on the same day of the month, would simplify bookkeeping, payrolls and permit more satisfactory arrangement of days off.—Chillicothe (Ohio) *News Advertiser.*

Perhaps after the war it will be possible to achieve unity on the proposal to have a fixed Easter.—Heckmondwike (England) *Herald.*

It may be that those people who now celebrate their birthdays every four years because of an idiosyncrasy in our calendar will yet live to hold an annual celebration like the rest of us.—Kelso (Wash.) *Kelsonian.*

The World Calendar plan, which is rapidly receiving international recognition and which already has the approval of 14 governments, rearranges the length of the familiar 12 months.—Willmar (Minn.) *Tribune.*

Calendar reform would make the calendar symmetrical and in keeping with the solar year and the seasons.—Alton (Ill.) *Telegraph.*

The benefits to business and the individual alike are readily appreciated when the new calendar is studied.—Lovell (Wyo.) *Chronicle.*

Business would welcome the tidying up of the calendar.—Harrisburg (Pa.) *News.*

After Reading Please Pass On to Others

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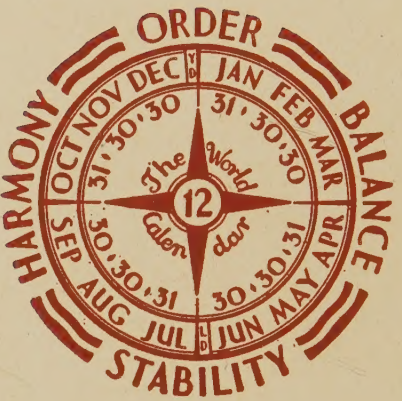

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